FOOD MANUFACTURE

Incorporating Food Industries Weekly

D HILL LIMITED. STRATFORD HOUSE. 9 EDEN STREET, LONDON, N.W.1 JULY 1, 1954

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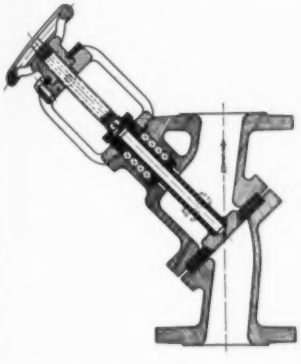

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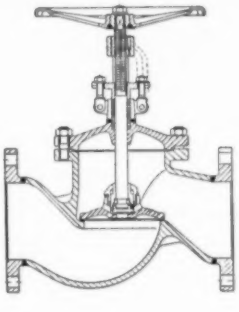

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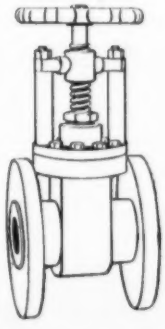

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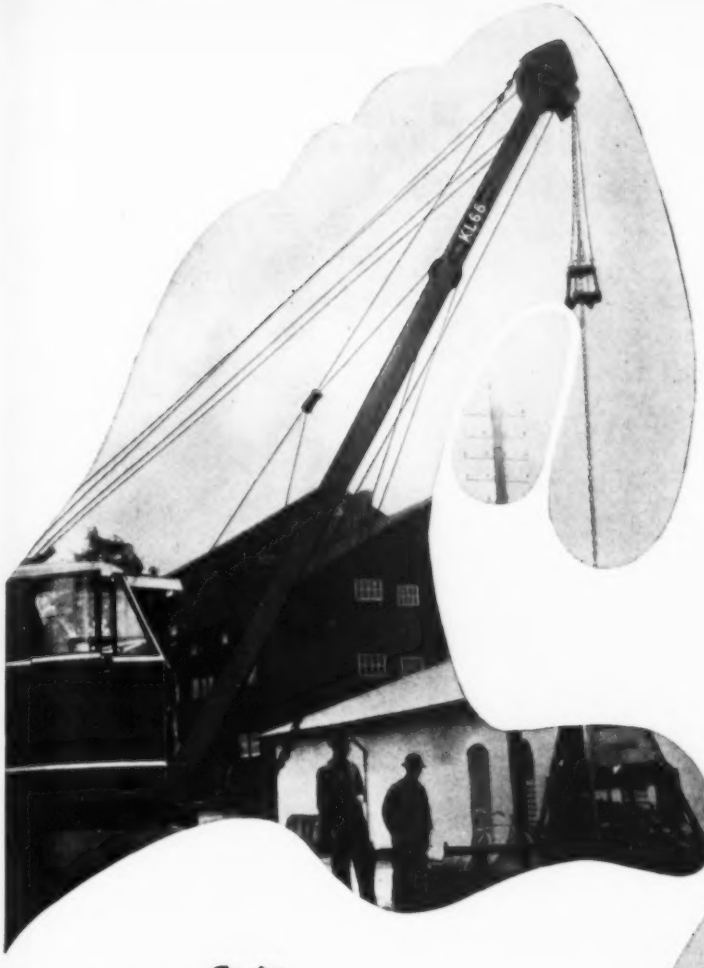
Index to ADVERTISERS

	Page
Acalor (1948) Ltd.	May
Accles & Pollock, Ltd.	Dec.
Advita, Ltd.	cxii
Agricultural & Chemical Products, Ltd.	cxv
Airguard, Ltd.	cxvi
Albro Fillers & Engg. Co. Ltd.	June
Alfa-Laval Co., Ltd.	xvii
Alginate Industries, Ltd.	Dec.
Alite Machines, Ltd.	June
All Purpose Building Co., Ltd.	April
Allen, Stafford, & Sons, Ltd.	xlv
Allspeeds, Ltd.	lxviii
Anderson, C. F., & Son, Ltd.	xcvii
Angel Warehouse Co. Ltd.	cxiv
Anglo-American Plastics, Ltd.	June
Anglo-American Vulcanized Fibre Co., Ltd.	June
A.P.V. Co. Ltd.	June
Arabol Mnfg. Co., Ltd.	Dec.
Associated Metal Works, Ltd.	xcviii
Autopack, Ltd.	cvii
Barber Medico-Electronic Laboratories, Ltd.	Jan.
Barron, W. S., & Son, Ltd.	June
Bayer Products, Ltd.	June
Bear Honey Co., Ltd.	lxviii
Beddington Nut & Produce Co., Ltd.	cxii
Begg, Cousland & Co., Ltd.	June
Bellingham & Stanley, Ltd.	June
Benjamin Electric, Ltd.	June
Bennett Sons & Shears, Ltd.	xii
Benninga (Mitcham), Ltd.	x
Bertrams, Ltd.	June
Blakeborough, J., & Sons, Ltd.	cxii
Bliss, E. W. (England), Ltd.	xlviii
Boehm, Fredk., Ltd.	lxx
Bonniksen & Cronk, Ltd.	May
Bos, F., Ltd.	xcviii
Bowater Sales Co., Ltd.	xxii, xxiii
Bowmaker Plant(), Ltd.	Feb.
Bowser, Monks & Whitehouse, Ltd.	c
Braby, Fredk., & Co., Ltd.	lx
Bramigk & Co., Ltd.	June
Bramwell, S., & Co., Ltd.	lxxxi
Brewers' Food Supply Co., Ltd.	Mar.
Brierley, Wm., Collier & Hartley, Ltd.	lxx
British Belting & Asbestos, Ltd.	xxxii
British Cellophane, Ltd.	June
British Electrical Development Association	lviii
British Hydrological Corporation	lvi
British Industries Fair	April
British Jeffrey-Diamond, Ltd.	lxxiv
British Rayophane, Ltd.	June
British Thomson-Houston Co., (Rugby)	May
British Wedge Wire Co., Ltd.	liv
British & Western European Trading Co.	Aug.
Broadbent, Thomas, & Sons, Ltd.	xiv
Brockhouse Heater & Co., Ltd.	cvii
Brook Motors, Ltd.	lii
Brown Fintube (Great Britain), Ltd.	Mar.
Brown & Forth, Ltd.	cxvi
Brown & Polson, Ltd.	xxx
Bryan, Wm., Ltd.	xciv
Building Trade Supplies	lxxii
Bulmer, H. P., & Co., Ltd.	xcii
Burnett & Rolfe, Ltd.	Dec.
Bush, W. J., & Co., Ltd.	Cover i
Buss, Ltd.	Feb.
Butterfield, W. P., Ltd.	June
Caleb Duckworth, Ltd.	June
Calfos, Ltd.	cxi
Cambitzi, G., & Co., Ltd.	xcviii
Cambridge Instrument Co., Ltd.	April
Canning Town Glass Works, Ltd.	cvi
Chamberlain & Willows	cxii
Chelsea Flour Mills, Ltd.	Jan.
Cinema Television, Ltd.	June
Clarke-Built, Ltd.	vi
Clark, George, & Co., Ltd.	June
Clark, T. & C., & Co., Ltd.	June
Coates Bros. Inks, Ltd.	xlvii
Cohen, George, Sons & Co., Ltd.	v
Colt Ventilation	lxxix
Commer Cars, Ltd.	viii
Confectioners' Vegetable Colours & Fruit Essences Co., Ltd.	xcvi
Coombs, H. A., Ltd.	June
Cooper, McDougall & Robertson, Ltd.	lxxvii
Co-operative Wholesale Socy.	Dec.
Corn Products Co., Ltd.	xxx
Creamery Package Mnfg. Co., Ltd.	June
Crofts (Engineers), Ltd.	lxxv
Crompton Parkinson, Ltd.	lxxiii
Cumming Parsons, Ltd.	lxxvi
Dale, John, Ltd.	April
Danks, Edwin, & Co., Ltd.	June
Dave;, Paxman & Co., Ltd.	June
Dawson Bros., Ltd.	xxxiv
De La Rue, Thomas, & Co., Ltd.	Mar.
Demby, Hamilton & Co., Ltd.	lxxi
Denton & Jutsum, Ltd.	April
Dexion, Ltd.	Dec.
Distillers Co., Ltd.	May
D.M.P. Sales	Cover iv
Drakesons	cxv
Drayton Regulator & Instrument Co.	June
Duche, T. M., & Sons, Ltd.	xciv
Electropower Gears, Ltd.	lxxvi
Electrolux, Ltd.	June
English Grains Co., Ltd.	June
Evan Cook's Packers, Ltd.	June
Evans, Wm., & Co., Ltd.	June
Everitt & Co., Ltd.	June
Feaver, John, Ltd.	ix
Felber, Jucker & Co., Ltd.	June
Fell & Briant, Ltd.	June
Fenner, J. H., & Co., Ltd.	xcvi
Filling Machines, Ltd.	xcvii
Finch & Knight, Ltd.	cxvi
Fisher & Ludlow, Ltd.	June
Fishers' Foils, Ltd.	June
Fison, Edward, Ltd.	xxiv
Flexible Packaging, Ltd.	lxix
Flexo Plywood Industries, Ltd.	June
F.M.S. (Farm Products), Ltd.	lxxx
Food Machines (Slough), Ltd.	xc
Fox, Samuel, & Co., Ltd.	June
Frankfurt International Fair	Feb.
Fraser, J., & Son, Ltd.	xcviii
Frischmann, H.	cx
Fuller Horsey, Sons & Cassell	cxvi
Gardner, Wm., & Sons (Glos.), Ltd.	June
Garrould, E. & R., Ltd.	June
Garvin, L., & Co., Ltd.	lxviii
Gas Council	xxxvi
Geo. H. Gascoigne Co., Ltd.	May
G.C. Engineering Co., Ltd.	June
Gearaide, Ltd.	June
Gee Manufacturing Co., Ltd.	June
General Electric Co., Ltd.	xxxviii
Girdlestone Pumps, Ltd.	c
Giusti, T., & Son, Ltd.	cxi
Glentham Essence Co., Ltd.	lxxxvi
Gloy & Empire Adhesives, Ltd.	cxvi
Goodyear Pliofilm	Nov.
Goring Kerr, Ltd.	cx
Gosheron, John, & Co., Ltd.	cv
Graham & Co., Ltd.	c
Gresham & Craven, Ltd.	Dec.
Grew, James, & Co., Ltd.	June
G.W.B. Electric Furnaces, Ltd.	Dec.
Haller & Phillips, Ltd.	June
Hamburger, M., & Sons	cii
Hangers Paints, Ltd.	June
Hanovia, Ltd.	lxxxvii
Hardaker, John T., Ltd.	xciii
Harvey, G. A., Ltd.	xcvi
Havinden, G., Ltd.	June
Herbert, Sidney, & Co.	April
Heston Equipment Co., Ltd.	xx
High Duty Alloys, Ltd.	lxvii
Hillier Parker May & Rowden	Dec.
Hilton, Wallace & Co., Ltd.	Dec.
Hogg, Thos.	May
Honeywell-Brown, Ltd.	I
Hopkinsons, Ltd.	xcv
Horton Mnfg. Co., Ltd.	xc
Howard Pneumatic Engg. Co., Ltd.	xxxix
Howard & Sons, Ltd.	Nov.
Howards (Colney), Ltd.	lxvi
Hubbard, W. J., & Sons, Ltd.	May
Hull Development Committee	cx
Hunt, John (Bolton), Ltd.	lxv
Imperial Chemical Industries, Ltd.	xxv, xxxvii
Incandescent Heat Co., Ltd.	April
Industrial Tapes, Ltd.	Jan.
Insecta Laboratories, Ltd.	lxxii
International Exhibition of Gastronomy and Tourism	June
Interscience Publishers, Ltd.	Dec.
J. & R. (Butchers) Supplies, Ltd.	cviii
Jenkins, Robert, & Co., Ltd.	lxxxv
Jenner, A. & C., Co., Ltd.	xli
Johnson, Andrews, & Son, Ltd.	April
Johnson, A., & Co., Ltd.	June
Johnson & Johnson (Great Britain), Ltd.	June
Johnsons (Darley Dale), Ltd.	June
Jones Cranes	v
Jones, Samuel, & Co., Ltd.	lxii
Judd Budd, Ltd.	Dec.
Kane, Frederick C., Ltd.	Mar.
Kay Bros., Ltd.	Dec.
K.D.G. Instruments, Ltd.	Jan.
Kek, Ltd.	June
Kellie, R. & Son, Ltd.	xl
Kellys, John (London), Ltd.	Mar.
Kemball, Bishop & Co., Ltd.	June
Kemp, Frank, Ltd.	June
Kestner Evaporator & Engg. Co., Ltd.	cix
Kidde, Walter, Co., Ltd.	May
Kimpton Bros., Ltd.	Feb.
Lacy-Hulbert & Co Co., Ltd.	May
Lambert, L., & Co., Ltd.	lxiv
Lautier Fils, Ltd.	June
Leiner, P., & Sons, Ltd.	xix, xxvi
Levasseur, L., & Co., Ltd.	cx
Lewis, H. K., & Co., Ltd.	Oct.
Loders & Nucoline, Ltd.	lxxxiii
Loma Electronic Equipment, Ltd.	June
Londex, Ltd.	Mar.
Longwood Engg. Co., Ltd.	lxxxv
Machinery (Continental), Ltd.	iii
Magnetic Valve Co., Ltd.	lxxxvi
Maitlands (Metal Works), Ltd.	xcviii
Marshall, A. L. (Carlton), Ltd.	cix
Mather & Platt, Ltd.	June
May & Baker, Ltd.	May
Measurement Ltd.	xxxv
Medway Corrugated Paper Co., Ltd.	June
Metafiltration Co., Ltd.	lxiv
Metal Box Co., Ltd.	xxi
Metal Closures, Ltd.	lvii
Metal Propellers, Ltd.	June
Microsol Industries, Ltd.	xxxiii
Midland Silicones, Ltd.	Feb.
Minerval Produce Co.	Sept.
Minnesota Mining & Mnfg. Co., Ltd.	Dec.
Mitchell Engineering, Ltd.	xxxi
Mono Pumps, Ltd.	ciii
Monsanto Chemicals, Ltd.	Cover ii
Morning Foods, Ltd.	Dec.
Morton Machine Co., Ltd.	Sept.
Morton, Roberts, & Co., Ltd.	May
Musgrave & Co., Ltd.	Mar.
Myers & Foulkes	June
National Adhesives, Ltd.	lv
National Glass Works (York), Ltd.	cii
Negretti & Zambra, Ltd.	cv
Newalls Insulation Co., Ltd.	June
Nipa Laboratories, Ltd.	May
Norman Engg. Co.	June
Northern Ireland Distributors, Ltd.	xci
Norwood, W., & Sons, Ltd.	cii
Nu-Swift, Ltd.	cxii
Nutregen, Ltd.	June
Oppenheimer Casing (U.K.), Ltd.	Feb.
Optrex, Ltd.	xci
Ormerod Engineers, Ltd.	xci
Osborne Engineers, Ltd.	xxix
Oury, Millar & Co., Ltd.	May
Padley & Venables, Ltd.	June
P.A.M., Ltd.	ciii
Palmer Mann & Co., Ltd.	Feb.
Palmer, S. J., N/C) Ltd.	April
Pascall Engineering Co., Ltd.	cviii
Pearn, Frank, & Co., Ltd.	Mar.
Peerless & Ericsson, Ltd.	lxxxix



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Index to ADVERTISERS

	Page
Permoglaze, Ltd.	cvi
Permutit Co., Ltd.	xliv
Peters, G. D., Ltd.	li
Philips Electrical, Ltd.	June
Pilkington Bros., Ltd.	Mar.
Plenty & Son, Ltd.	cviii
Polak & Schwarz, Ltd.	May
Porteus, G., & Sons, Ltd.	June
Powell & Co.	cxiv
Power Jacks, Ltd.	June
Powlings Patent Processes, Ltd.	xlvii
Premier Colloid Mills, Ltd.	vii
Premier Filterpress Co., Ltd.	June
Pressed Steel Co., Ltd.	Nov.
Pulsometer Engg. Co., Ltd.	cxvi
Purdy Machinery Co., Ltd.	June
Quickset Water Sealers, Ltd.	Feb.
Quiz Electrics, Ltd.	Feb.
Q.V.F., Ltd.	May
Ransomes, Sims & Jefferies, Ltd.	Feb.
Rapid Magnetic Machines, Ltd.	June
Rayner & Co., Ltd.	June
Reads, Ltd.	lxxxii
Realm Engineering Works, Ltd.	lxxxviii
Red Breast Preserving Co., Ltd.	Dec.
Redler Conveyors, Ltd.	Oct.
Reigate Warehouses	lxxii
Roberts, David, & Son	May
Robinson, R., & Co., Ltd.	Mar.
Rotoplunge Pump Co., Ltd.	cvi
Rowe Bros., Ltd.	lxvi
Royles, Ltd.	xxvii
R.T.S.C. Home Sales, Ltd.	June
Rubber Improvement, Ltd.	Aug.
Russell Constructions, Ltd.	xxviii

	Page
Sack Filling & Sewing Machine Syndicate, Ltd.	Mar.
Samuelson, P., & Co., Ltd.	May
Saunders Valve Co., Ltd.	xviii
Sauven Perforating Machine Co.	civ
Saxon Engg. Co., Ltd.	ci
Scherer, R. P., Ltd.	June
Scientific Subscription Service	Feb.
Sculthorp, R., & Co., Ltd.	ci
Semtex, Ltd.	xlix
Seyfried, John F., & Sons, Ltd.	Sept.
S.F.P. (Food Products), Ltd.	xcviii
Shell Chemicals, Ltd.	June
Short & Mason, Ltd.	Feb.
Sieber, James, Ltd.	Jan.
Sigmund Pumps, Ltd.	April
Silber, L. I., & Co., Ltd.	cxii
Silverson Machines (Sales), Ltd.	June
Simon, Henry, Ltd.	xv
Skerman, C., & Co., Ltd.	cxv
SMALL ADVERTISMENTS	cxiii-cxv
Small Electric Motors, Ltd.	lxxxix
Smith Bros., & Co., Ltd.	Oct.
Spirax-Sarco, Ltd.	xiii
Standard Synthetics, Ltd.	Jan.
Star Welding Co., The	June
Stelcon (Industrial) Floors, Ltd.	lxi
Stevenson & Howell, Ltd.	lxxxviii
Sturge, J. & E., Ltd.	xcii
Sturtevant Engineering Co., Ltd.	lix
Tate & Lyle, Ltd.	xcix
Taylor Rustless Fittings Co., Ltd.	xciii
Teleflex Products, Ltd.	xcix
Tenaplas (Sales), Ltd.	Dec.
Thames Board Mills, Ltd.	June
Thomas, Richard, & Baldwins, Ltd.	Cover iii
Thompson, John, (Dudley), Ltd.	June
Thompson & Norris Mfng. Co., Ltd.	Dec.
Trapow, D., & Co., Ltd.	April
Tunnel Glucose Refineries, Ltd.	cviii

	Page
Ultrasonics, Ltd.	May
Union Food Machinery Co., Ltd.	June
United Glass Bottle Mnfrs., Ltd.	xliii, xlvi
United Indigo & Chemical Co., Ltd.	xvi
U.K. Dried Fruit Co., Ltd., The	Nov.
United Steel Companies, Ltd.	June
Universal Metal Products, Ltd.	Oct.
Usines Vermylen S.A.	civ
Valley Products (Lye), Ltd.	civ
Vauxhall Motors, Ltd.	Oct.
Venesta, Ltd.	June
Vickers-Armstrongs, Ltd.	Dec.
Viscose Development Co., Ltd.	Nov.
WAECO, Ltd. (Fumite Division)	cvi
Walker, Crosweller & Co., Ltd.	lxxviii
Walworth, Ltd.	Oct.
Warwick Production Co., Ltd.	liii
Washington Chemical Co., Ltd.	xi
Watten Emulsifying Machines, Ltd.	Mar.
Webster, Isaac, & Sons, Ltd.	cii
Weir, G. & J., Ltd.	June
Westool, Ltd.	Jan.
Wetter, J. C., & Co., Ltd.	lxxiv
Wheatly & Co., Ltd.	April
Whiffen & Sons, Ltd.	June
White, Tomkins & Courage, Ltd.	xlii
Whittaker, Arthur	cxiii
Willcox, W. H., & Co., Ltd.	lxxxiv
Williams (Hounslow), Ltd.	June
Wiseman, Alfred, & Co., Ltd.	civ
Worham, Antony, Ltd.	Mar.
York Shipley, Ltd.	lxiii
Yorkshire Engineering & Welding Co., Ltd.	lxxxvii

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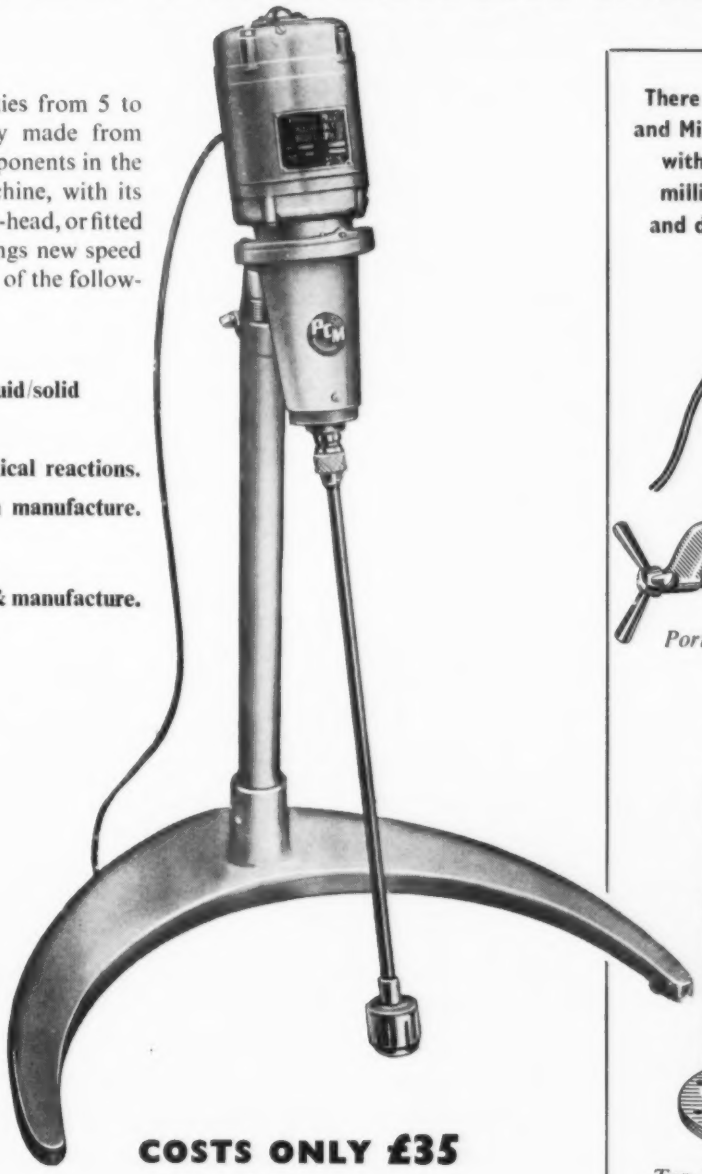

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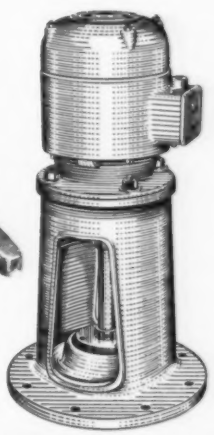

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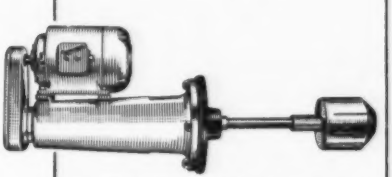

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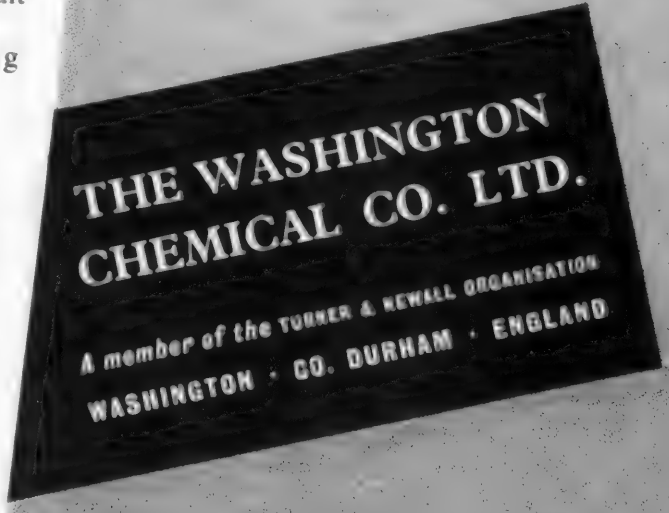
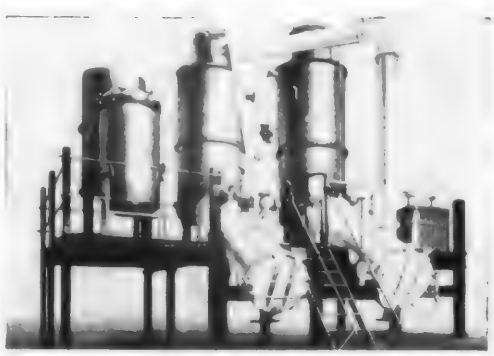


She sells blossoms - we sell plants!



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DOUBLE EFFECT EVAPORATOR
WITH THERMO-COMPRESSION

We have been winning bouquets from generations of satisfied customers, for Bennetts are specialists in planning, designing and installing Manufacturing and Processing Plant and are well used to handling individual problems in an individual manner. We have been doing it since 1820 and we do it well.

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Controlled by H. Pontifex & Sons, Ltd.

FOR CHEMICAL AND FOOD PROCESSING PLANT IN STAINLESS STEEL, COPPER, ALUMINIUM, ETC.

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Increased output from process steam plant by AUTOMATIC VENTING of air

AIR in the steam spaces of process heating units prevents the plant from giving its best output. Why is that? Is it a general condition? Is it serious? What can be done about it?

A few questions and answers:

Q: *Where does the air come from?*
A: When steam is off, air enters through valves, traps, joints, and fills the pipes and the steam spaces of the plant.

Q: *What harm can the air do?*
A: It does a surprising amount of harm. When steam enters the units it condenses, but the air cannot condense. And if it cannot get out, the air does two things; it hangs about as a stagnant film on the inside surfaces, and it mixes with the steam.

Q: *What then?*
A: The film of air puts up a tremendous resistance to the flow of heat from the steam to the process. That reduced heat transfer slows down the job, often seriously. The air that mixes with the steam reduces the effective temperature of the steam.

Q: *Can't the air get out through the steam traps?*
A: Sometimes yes, sometimes no. Some steam traps can cope with air, some cannot. But even using traps that can release air, on many jobs a lot of the air cannot get to the traps anyway. Something else has to be done.

Q: *What else?*
A: You can use hand cocks, but they are hardly ever satisfactory: either a lot of steam is blown to waste or a lot of the air never gets out. The only satisfactory way is to use automatic air vents.

> "Of all the problems that confront the steam user, the removal of air from inside heating surfaces is the most neglected, yet it is one of the most important. . . . Air is the arch enemy in steam and must be removed as rapidly and completely as possible."
>
> — *Oliver Lyle in "The Efficient Use of Steam."*

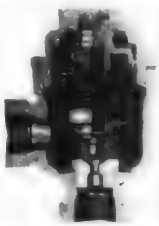
Q: *What are the advantages of automatic air venting?*
A: The vents automatically open to air but close to steam. On starting up the job, air is released full bore through the vents, giving quicker starting (warming-up times have been halved); the vents open to discharge any air that collects during running. They accelerate heat transfer and improve processing temperatures. They make possible a much better output performance (10 per cent., 15 per cent., even more, according to the particular condition).

Q: *Where can I find out more about automatic air venting?*
A: Send the request slip for the Information Sheet "Air in Steam Spaces" and the Pamphlet describing Spirax Automatic Air Vents.

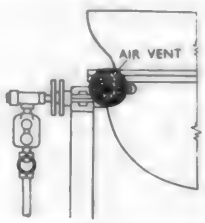
Spirax-Sarco Ltd CHELTENHAM *Phone: Cheltenham 5175-76 Grams: Spirax, Cheltenham*

LONDON OFFICE: *28 Victoria Street, S.W.1. Abbey 6101-3832*

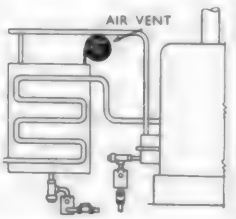
One of the series of Spirax Thermostatic (Automatic) Air Vents.

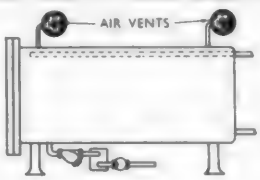


Spirax Automatic Air Vents for steam-jacketed boiling pans.



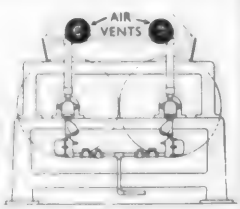
Spirax Automatic Air Vents for stills of various types.



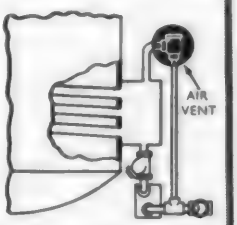


Spirax Automatic Air Vents for retorts and digesters.

Spirax Automatic Air Vents for cylinder drying machines.



Spirax Automatic Air Vents for evaporators of various types.



FOR INFORMATION PLEASE USE THIS REQUEST SLIP

Please send Information Sheet "Air in Steam Spaces" and Pamphlet No. 108 on Spirax Automatic Air Vents.

NAME

ADDRESS

FM 754

SPIRAX STEAM TRAPPING AND AIR VENTING

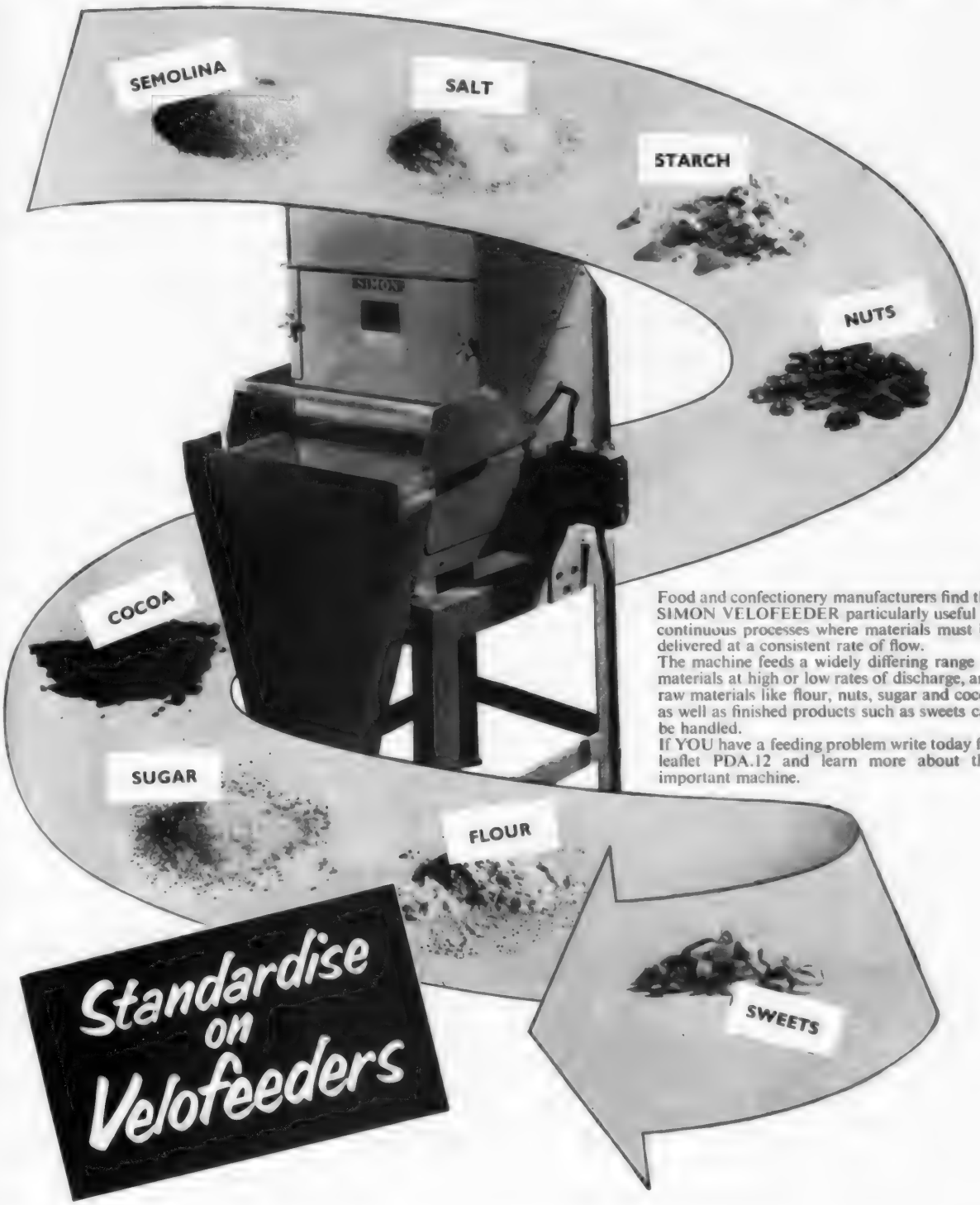
This modern battery of high speed Broadbent Centrifugals in Australia processes a large output of superior quality white sugar.

FOOD RAPIDLY AND HYGIENICALLY PROCESSED THE BROADBENT WAY

To process modern foods economically, effectively and with maximum output, insist on installing BROADBENT HIGH-SPEED CENTRIFUGALS. The extensive range covers numerous applications and the prepared food retains its original flavour and purity as suitable corrosion resisting materials are used.

THOMAS BROADBENT & SONS LIMITED

THE SIMON VELOFEEDER



Food and confectionery manufacturers find the SIMON VELOFEEDER particularly useful in continuous processes where materials must be delivered at a consistent rate of flow.
The machine feeds a widely differing range of materials at high or low rates of discharge, and raw materials like flour, nuts, sugar and cocoa as well as finished products such as sweets can be handled.
If YOU have a feeding problem write today for leaflet PDA.12 and learn more about this important machine.

Standardise on Velofeeders

Industrial plant by **Henry Simon Ltd**

SIMON ENGINEERING GROUP

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Enquiries will always receive our best attention.

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NEARLY 100 YEARS

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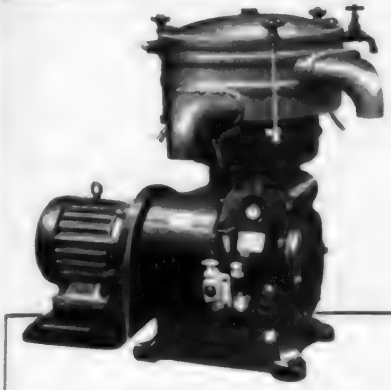
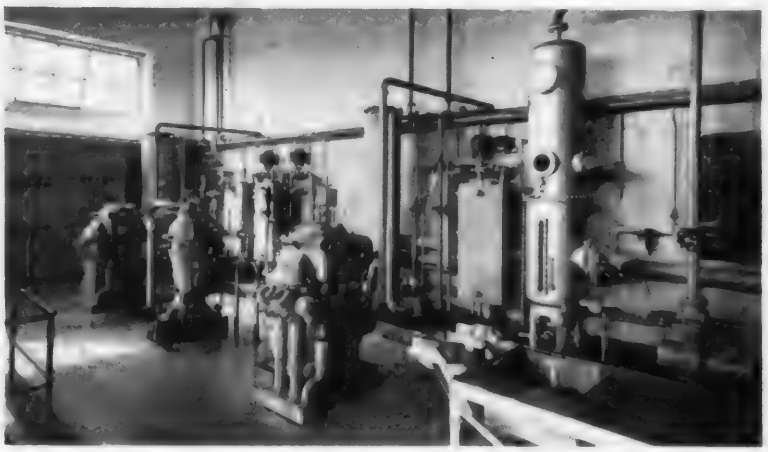
DE LAVAL EQUIPMENT

in the PROCESS INDUSTRIES



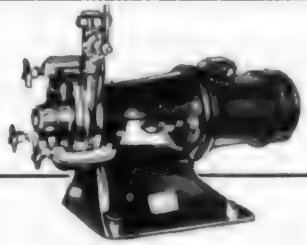
DE LAVAL CENTRIFUGAL SEPARATORS

For the continuous separation of immiscible liquids or clarification of one liquid. The type illustrated is a vapour tight model of capacities up to 2,000 g.p.h. Smaller machines are available from 5 g.p.h. upwards. These machines are widely used for solvent separation in counter current solvent extraction systems.



COMPLETE DE LAVAL ENGINEERED PLANTS

De Laval Engineered plants are supplied for many purposes. Illustrated is a modern De Laval Short Mix Refining Plant for treating 40 tons/24 hours of vegetable oil.

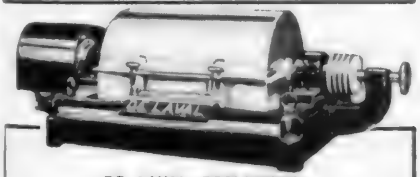


ALFA-LAVAL EASY CLEAN CENTRIFUGAL PUMPS

Capacity 200 – 13,000 g.p.h. Heads 30–90 feet. Stainless steel construction.

★ Consult the Process Plant Specialists *on your problem*

We have specialised knowledge of plants for dealing with, Starch and Gluten, Yeast and the Fermentation industries, Vegetable Oil, Fish Oil and Mineral Oil refining, etc.



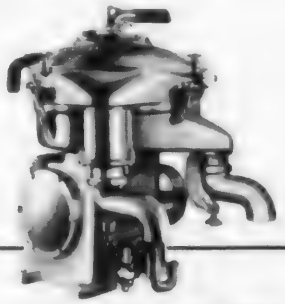
DE LAVAL DESLUDGER

Horizontal screw type centrifuge for the continuous separation of solids. Capacities up to 2,200 g.p.h.

ALFA-LAVAL PLATE HEAT EXCHANGERS

Unsurpassed for Heat transfer efficiency. Stainless Steel Easy Clean type. For Heating, Cooling, Heat recovery, Pasteurisation, etc.

One factory recently installed Alfa-Laval Heat Exchangers and now saves 3 tons/coal per hour.



DE-LAVAL NOZZLE SEPARATORS

For the continuous 2-way and 3-way separation of liquids and solids. Capacities up to 6,000 g.p.h. of liquids containing higher percentages of solids.

PROCESS ENGINEERING DIVISION

ALFA-LAVAL CO. LTD.
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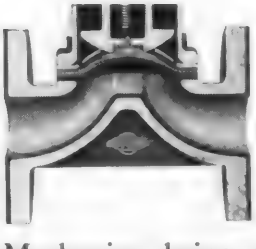
Telephone: EALING 0116

Smee's DL 280

Corrosive attack fails against Saunders EBONITE Valve



External attack from acid laden atmospheres is repulsed by this Saunders Diaphragm Valve with Ebonite body, bonnet and hand-wheel, as is the most virulent fifth columnist fluid from within. Engineers and chemists have long known the value of the Saunders Valve for handling difficult fluids. Mechanism being within a sealed chamber is remote and immune from chemical and abrasive attacks.

SAUNDERS DIAPHRAGM VALVES

SAUNDERS VALVE COMPANY LIMITED

DIAPHRAGM VALVE DIVISION

CWMBRAN MONMOUTHSHIRE ENGLAND

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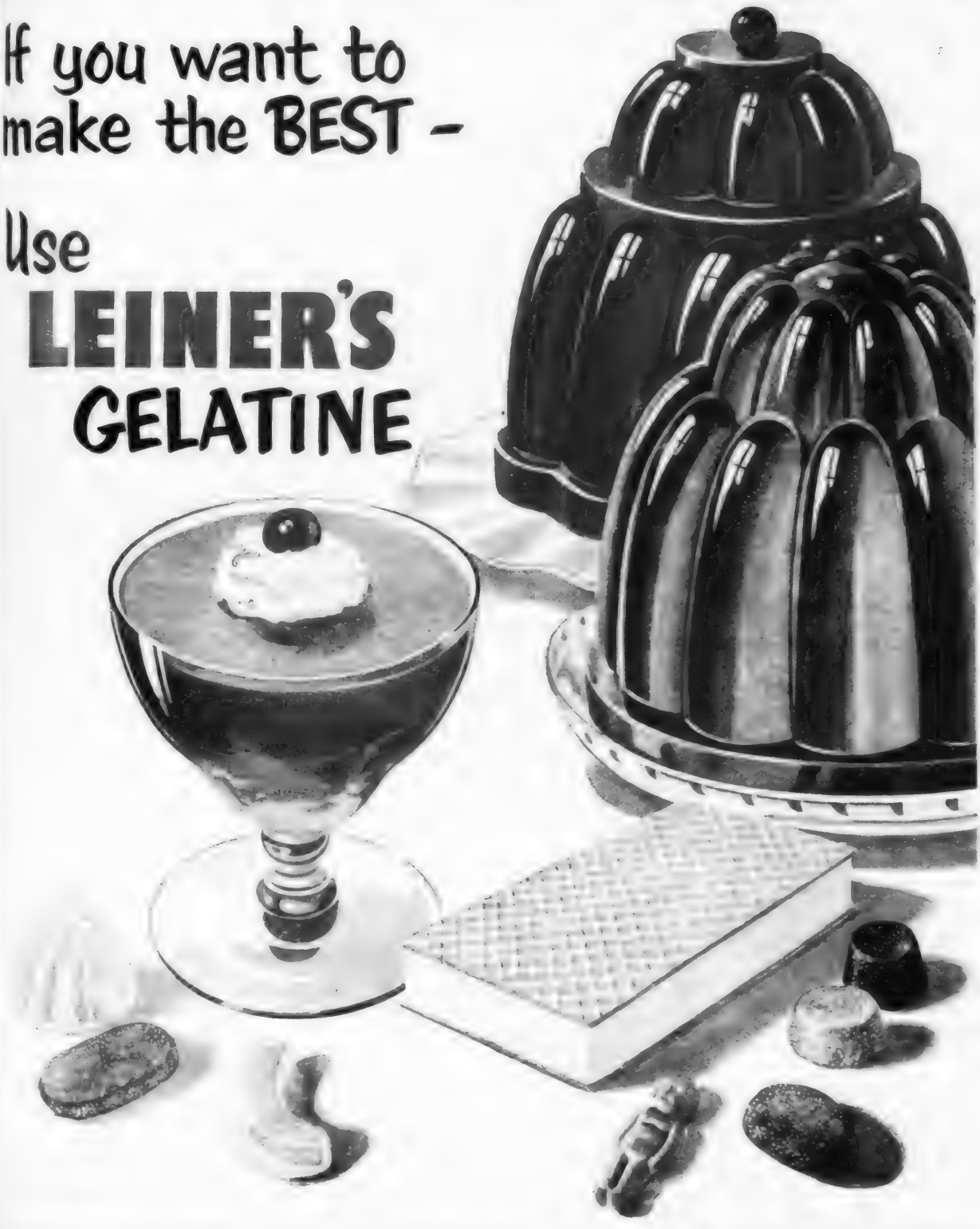

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Manufacturers of Gelatine for over a Century

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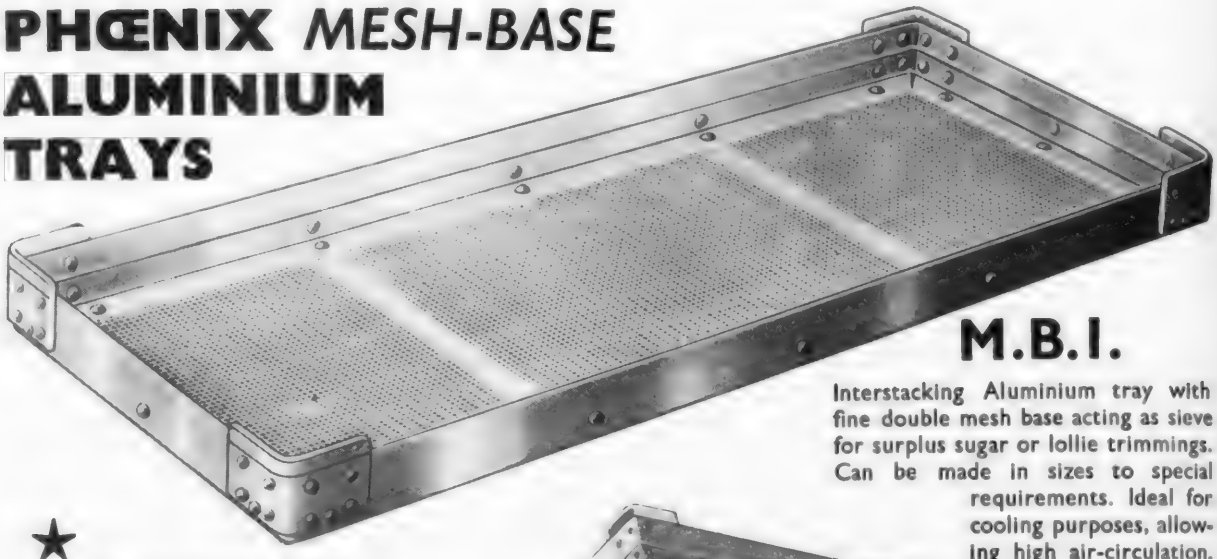
PHŒNIX *MESH-BASE* ALUMINIUM TRAYS



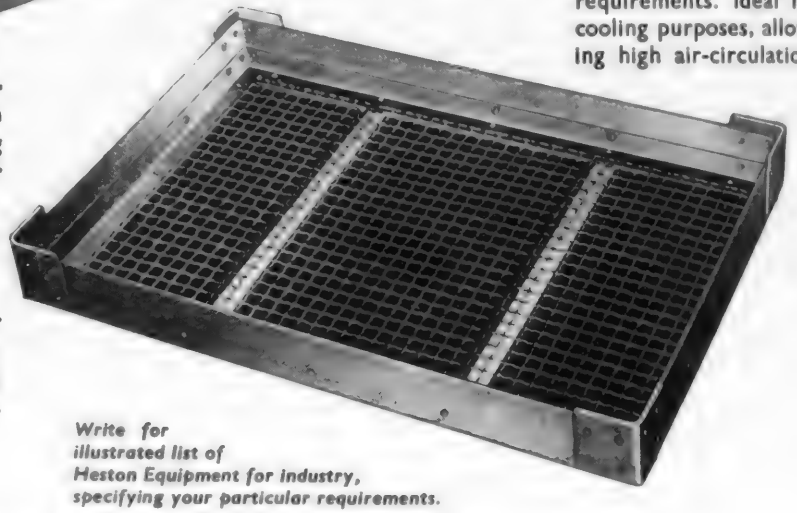
M.B.1.

Interstacking Aluminium tray with fine double mesh base acting as sieve for surplus sugar or lollie trimmings. Can be made in sizes to special requirements. Ideal for cooling purposes, allowing high air-circulation.

★ **Precision designed and manufactured in high grade aluminium with reinforced interstacking corner pieces. For sieve or cooling purposes.**

M.B.2.

Square mesh Tray for sieve or cooling purposes. Strongly made in stout aluminium with reinforced corner angles designed for interstacking.



Write for illustrated list of Heston Equipment for industry, specifying your particular requirements.

Special quotation for steel, stainless steel or galvanized equipment.

PHŒNIX *is the answer*

Heston Equipment Company Limited

CENTRAL SALES OFFICE:

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Metal Box *'know-how'* does count!

The Metal Box Company is well-known for the production of highly decorated boxes for the confectionery trade. These attractive containers, with their full-colour surface decoration and their suitability for re-use, make an immediate appeal to the purchasing public. And now, with the acquisition of Flexible Packaging Limited and Brown, Bibby & Gregory Limited, the Metal Box service includes the provision of flexible packages and film and foil laminates, as well as metal containers, cartons and composite containers. The Company's design service and technical advice covers many types of package. For Metal Box offers the complete packaging service and its know-how is at the disposal of all manufacturers with a packaging problem to solve.

THE METAL BOX COMPANY LIMITED

Metal Containers · Paper Products · Flexible Packages · Plastic films and Laminates

THE LANGHAM · PORTLAND PLACE · LONDON W.1

BOWATERS PACKAGIN

Bespoke Packaging

THERE IS NO SINGLE PROBLEM of packaging. There are thousands of them, all different and all specialised — each dependent on the character of the material to be packaged and the technique brought to the task.

In the years since the war the Bowater Organisation has devoted an increasing share of its tremendous resources to solving packaging problems for commerce and industry on almost every level of activity. For this task Bowaters are particularly well equipped. From the great North American timberlands through the Organisation's pulp and paper mills to the actual converting factories, they control not only the making but also the conversion of paper into the packaging products in their final form. The chain of service is thus complete.

Accepting each new packaging problem as a challenge to ingenuity, Bowaters are never satisfied with an off-the-peg answer. It must be tailor-made to suit the commodity; and the conditions under which it is filled, sealed, stored, transported and used. And the Bowater research laboratory, working in parallel with the men in the field, experiments continuously with new materials—even better, stronger, more adaptable materials in anticipation of ever more exacting demands from Britain's makers of goods.

This new series of Bulletins will record new developments, describe processes of interest and, over the next few months, provide a complete picture of the packaging activities of the Bowater Organisation. Here, for a start, is a review of the things that Bowaters make.

Bags by the mile

You can buy most types of paper b from Bowaters, made in a variety forms, from white papers, brown (kra papers, greaseproof, glassine and c lulose film. And just one of the m high-speed Bowater machines can pr duce more than 12 miles of bags ev hour. For manufacturers Bowat make waxed bags (carton liner laminated bags (double-plied f special protection), film and glassi bags (to protect and display the pr duct), V.P.I. bags (to inhibit corrosi of engineering products). In additio there are the counter and carrier ba for retailers, millions of them. All c be bought plain or printed. T Bowater Studio will design for you, you wish. Bowaters are conscious the growing need for attractive, hand packages in the self-service field a have plenty of ideas to discuss wi you. In fact, they are at your co mand on any special bag problem y may have now or in the future.

For information and advice on any aspect of packaging mentioned here, please write to :

Divisional Sales Manager, Packaging Division, Bowater House, Stratton Street, London, W.1 GRO. 4161

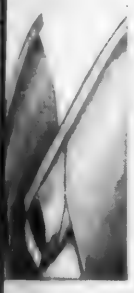
ULLETIN

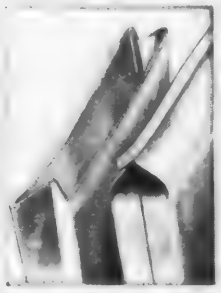
Cosmetic creams are among the many delicate and costly products which travel safely in Bowaters polythene-lined fibre drums. This cream is being poured at a temperature of 60° C into a Pattern H drum.

Drums rolling

...t is no halt to the flow of robust ...ter drums off the production lines ...Brentford and Disley. Made of ...best kraft paper, these drums give ...late protection to a remarkable ... of products, from dry powders ...ake linings, taking in creams and ..., glass lampshades, brass wire ...men's hats on the way. Of par... interest are the polythene liners, ...ally tailored to fit Bowaters drums, ...h make it possible to pack hygro... and corrosive chemicals, creams ... pastes — even mincemeat* — in ...ute confidence of safe transit and ...l. Bowaters provide a useful extra service for their drum customers. They will, if you wish, print on the drums in colour—an advertisement that also saves time and labour in stencilling or labelling.

* *Special note for manufacturers of good things for Christmas—mincemeat particularly. These polythene liners keep your product factory fresh from point of making to point of baking. Have a word with Bowaters in the next few days.*





Valves and open mouths

It is not surprising that there is an increasing demand for Bowaters multiwall sacks. They are good sacks and they are strong. They begin their tough existence as rolls of kraft paper. Converted into one of the three basic sack types (pasted valve, sewn valve or sewn open mouth) they can be made with any number of plies (or walls) according to the jobs they have to do (e.g. a grease-resisting inner or a waterproof outer ply). If you have a special container problem, to which a sack might be the answer, Bowaters back room boys will be happy to be let loose on it.

Wax eloquent

...owaters waxed wrappings do more than ...otect, they speak for the products they ...ntain—from the shelf, the counter, the ...indow. The voice they use is the voice of ...int. The gleaming white surface of Bowaters ...Special Opaque" waxed paper takes brilliant ...lour printing. As a result, the pack becomes ... shining advertisement for the product it ...otects—an encouragement to the retailer ...o display it, a magnet for the eye of the ...stomer.

These "Special Opaque" heat sealing ...axed papers have specially prepared coating ...hich makes them flexible in use, even at ...e low temperatures used in frozen food ...ocessing. Bread, biscuits and sweets are ...her commodities which use Bowaters ...axed wrappings for their attractiveness, ...cellent protection and low cost.

The services of the Bowater design studio ...re available to any manufacturer wishing to ...ve his product extra shelf, window and ...unter-appeal by presenting it in good ...ality waxed wrapping.

Fibre suits

Practically all mass produced goods travel to the point of sale in fibreboard. The local grocer's shop is full of goods which got there safely in a Bowater case, so are the local electrical shop, the hardware store and the chemist's. All depend on the extra strength of corrugated fibreboard containers to bring them merchandise in tip-top condition. Bowaters containers are tailor-made to fit the articles they carry. And, being lighter than other types of container, they will show considerable savings in carriage costs. Manufacturers naturally choose the best and strongest packages to avoid damage to their products and to preserve their good name. That is why Bowaters sell their full manufacturing capacity of corrugated fibreboard containers each year. Are they still interested in your container problem? Yes, and eager to help.

MALT EXTRACT

DRIED MALT EXTRACT POWDER

MALT FLOUR

An ever-increasing application to food industries

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Maltsters for more than a Century

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FOR FOODSTUFFS

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WE GUARANTEE THAT THE CONTENTS OF THIS PACKAGE, IF RECEIVED INTACT AND WITH OUR SEAL UNBROKEN, COMPLY WITH THE FOOD AND DRUGS ACT AND ALL OTHER STATUTORY REQUIREMENTS OR REGULATIONS IN FORCE IN GREAT BRITAIN RELATING TO THE SALE OF EDIBLE PRODUCTS.

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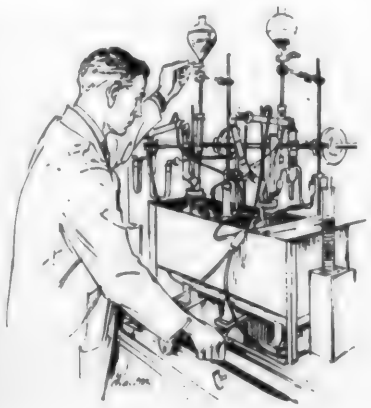
Modern plant and the greatest care in production ensure that 'Edicol' Supra Colours are absolutely pure. These colours enable manufacturers to achieve in their products the standard of purity demanded by the most exacting authorities in the world.

CONTROL

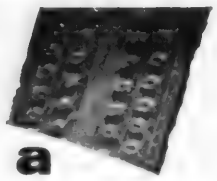
'Edicol' Supra Colours are manufactured under strict laboratory control at every stage. Manufacturers exporting to the U.S.A. will be particularly interested to note that 'certified' supplies of many of the colours (F.D. & C.) are available.



For further information please apply to:

IMPERIAL CHEMICAL INDUSTRIES LIMITED, LONDON, S.W.1

D.369



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the *Perfect* stabiliser....

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SUNSHINE GELATINE

No ice cream manufacturer should lose the opportunity of trying Leiner's SUNSHINE GELATINE—the newest ice cream stabiliser available. Sunshine Gelatine shows many advantages over other stabilisers and is **so economical** that only ½ of the amount of the customary gelatine is required to produce a perfect ice cream.

Every batch subjected to rigid chemical and bacteriological control to ensure **ABSOLUTE PURITY.**

Ask for FREE *sample*

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Manufacturers of Gelatine for over a Century

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Water Heating and Storage for the Food Industry

ROYLES STORAGE CALORIFIERS

Ensure that continuity of supply that is essential where industrial processing is concerned. With dependability go high performance and low upkeep, efficient steam usage and negligible maintenance needs. Royles Storage Calorifiers are the product of half-a-century's experience in serving the Food Industry and others, and are made in a wide range of sizes to suit all conditions.

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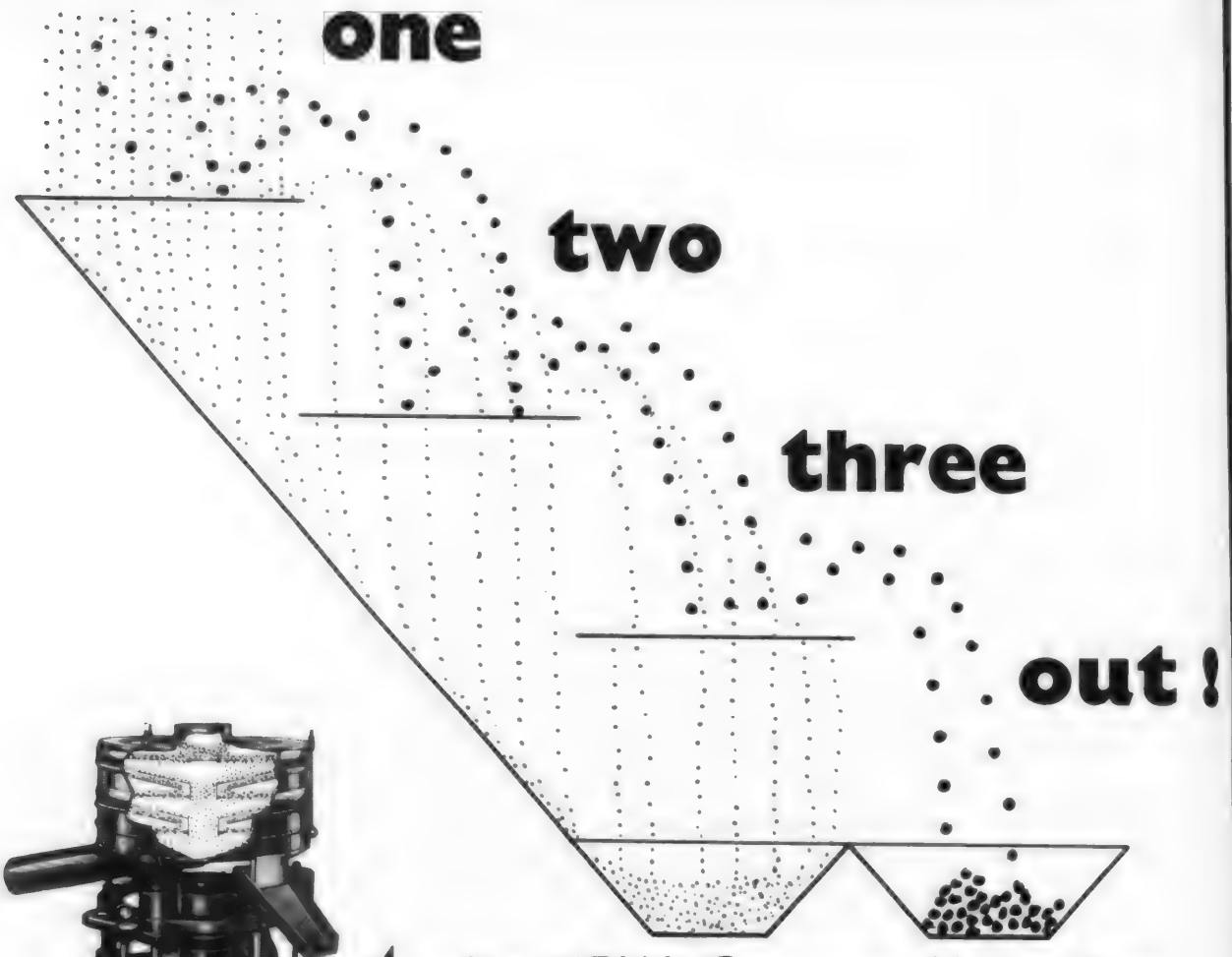

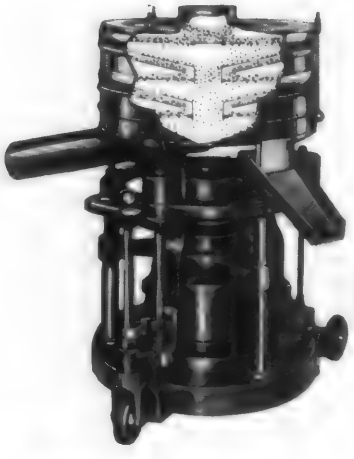

this NEW Gyratory Unit gives AUTOMATIC Rejection!

High-speed gyratory output . . . ! Continuous *automatic* rejection . . . ! *Why not both?* With the new Russell "CASCADE" unit you have gyratory sieving at three separate levels, fines passing to a central funnel at each level whilst oversize material is carried outside the mesh and finally ejected by a separate chute. The 6½ sq. ft. mesh area thus remains continuously clear of rejected material, and together with the high speeds, only possible with gyratory movement, gives a through-put that averages 12 *to* 18 *times that of shaker screens of equivalent area!* Available as Stand or Ceiling-Mounted unit; suitable for fabric or metal mesh, maximum unsupported length of mesh being only 8"; rubber mounting plus accurate balance of gyratory unit ensures minimum transference of vibration to frame, with maximum saving of power; both models quickly dismantled and re-meshed if necessary.

RUSSELL STAND MODEL:
Approx. 2′ × 3′6″; weight 4¼ cwt.

RUSSELL CEILING-MOUNTED MODEL:
Approx. 2′ 3″ floor aperture, 2′ 1″ projection below ceiling; weight 6½ cwt.

Write for illustrated literature and details of 28 DAYS' TRIAL

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'CASCADE' SIEVING & STRAINING UNIT

RUSSELL CONSTRUCTIONS LIMITED Russell House, 9 Adam Street, Adelphi, London, W.C.2. Tel.: TEMple Bar 0055-9 & 9815
Telegrams: Russelcon, Rand, London. Cables: Russelcon, London.

SOLE AGENTS TO THE BISCUIT INDUSTRY
T. & T. VICARS LTD · EARLESTOWN, NEWTON-LE-WILLOWS, LANCS

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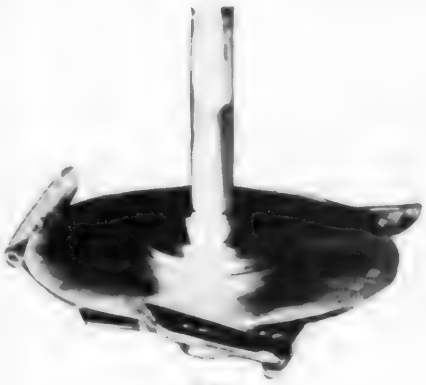
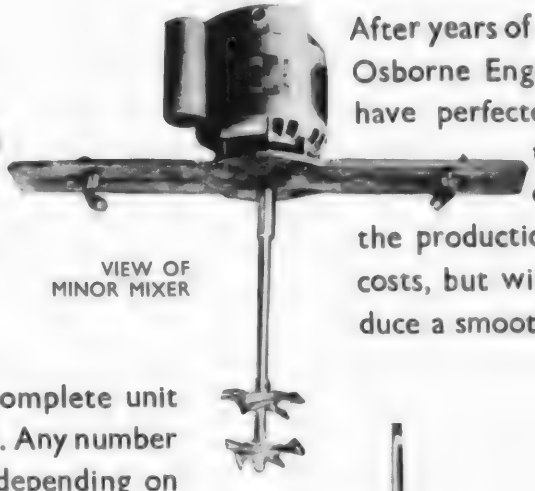
GET YOUR ORDER IN **NOW**
FOR THIS

AMAZING MIXER

WILL DO THE JOB BETTER IN HALF THE TIME



VIEW OF MIXING HEAD SHOWING ANGLES OF TUBES



VIEW OF MINOR MIXER

After years of experiment Osborne Engineers Ltd., have perfected a mixer that will not only halve the production time and costs, but will **also** produce a smoother mix.

Adjustable mixing heads or complete unit with drive supplied from stock. Any number of mixing heads can be used depending on the depth of the mix.

Our range consists of: **Major Mixer with or without Drive. Minor Mixer for fitting to Drums** 12 inches to 20 inches. Laboratory model (complete unit only).

Write for Details to:

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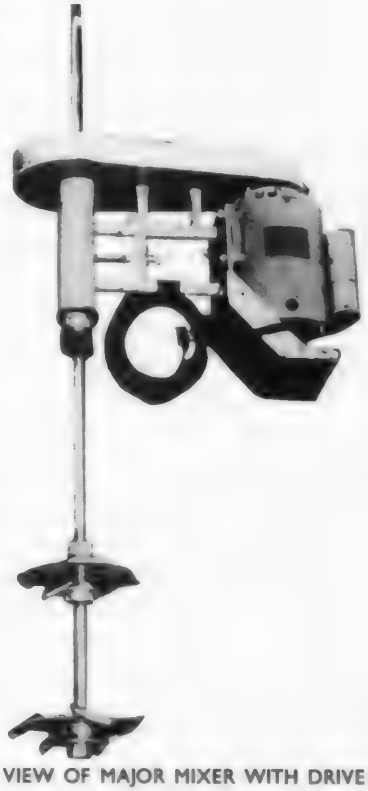

VIEW OF MAJOR MIXER WITH DRIVE

For 80 industries

More than
400
Brown & Polson
Starch
Products

The deep knowledge and wide practical experience we have gained by our huge and varied production for other industries is your guarantee that our starch products for the preserving industry will always be the best that can be made. And we can promise you knowledgeable and disinterested advice whenever you care to discuss with us proposed new uses for starch products in your business.

Starch
does surprising things
IN SUCH SURPRISING PLACES
STARCH IN ADHESIVES
Starch is the basis of a versatile range of adhesives which can be given a wide variety of special qualities to make them suitable for particular purposes: qualities such as quick or slow setting, great or small initial tack, resistance to moisture, harmlessness to colour, and the like. The sealing of cardboard packs is one of the many very large-scale uses of starch-based adhesives. Feculose Company Limited, one of the companies in the Industrial Division of Brown & Polson, have developed special, water-resistant adhesives with great success to solve packaging problems connected with export to humid tropical countries. Brown & Polson Industrial Division produce 200,000 tons of starch products a year: more than 400 products, which are helping more than 80 different industries to reduce production costs, to make better products, or even to make products that could not otherwise be made at all. We have spent more than 100 years in the building of this large and varied business. We have learned a lot about the industrial uses of starch products, and our advice is freely at your disposal.
CAN STARCH HELP YOU?
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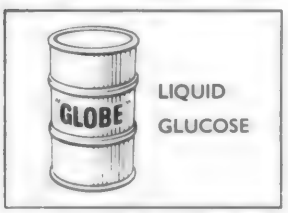
Watch the National press for advertisements like this one. When you read how starch products are helping other industries you may see new possibilities of turning them to account in your own business.

for you, in the Preserving Industry

Most jam manufacturers have encountered the problem of making jams that contain enough soluble solids to be satisfactory in quality, yet are not too sweet for their customers' taste and will not crystallise in storage. Most jam manufacturers are also aware that the best answer to this problem is to use less cane or beet sugar (sucrose) in their jams and make up the required soluble solids content with " Globe " liquid glucose. Glucose provides abundant food energy but is not as sweet as sucrose. When glucose is used in jam making to replace some of the sucrose it reduces excessive sweetness without reducing food value; it brings out the natural flavour of the fruit; it helps the jam to set; and it prevents crystallisation.

" Globe " liquid glucose is made from starch by Corn Products Company Limited—the Industrial Division of Brown & Polson—and we make the starch, too. Our careful control of every manufacturing process from the grain to the finished product is your assurance of the quality and purity you require in your preserves.



CORN PRODUCTS COMPANY LIMITED

THE INDUSTRIAL DIVISION OF B&P Brown & Polson

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Saves Labour Saves Space—

the JONES-MITCHELL

PATENTED HYDRO-SYSTEM PROCESS
PEA AND BEAN CANNING EQUIPMENT

The Jones-Mitchell Hydro process pea and bean line from the seamer and filler end.

Absence of moving parts and compact design contribute to the space and labour saving features of the Jones-Mitchell Hydro-System Process Pea and Bean Canning Equipment. Its handling is efficient and hygienic and the finished product has an attractive appearance.

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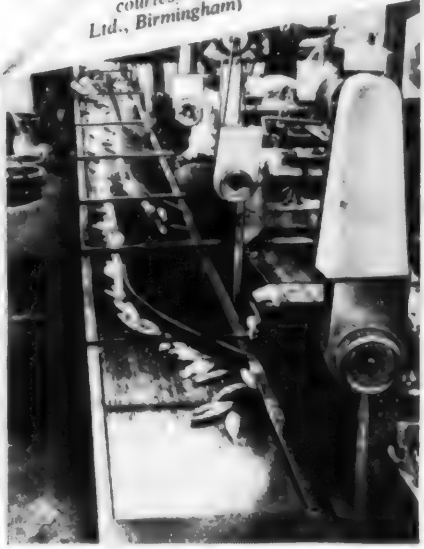
SCANDURA P.V.C. belting

helps the food industry

Cake packing on a 'Motaveyor' (by courtesy of Knightsbridge Cake Limited, Manchester)

Fruit bottling on a 'Motaveyor' conveyor (by courtesy of J. Mawdsley Ltd., Wigan)



Scandura conveyor in a fish canning factory (by courtesy of Fisher & Ludlow Ltd., Birmingham)

As the pioneers of P.V.C. covered conveyor belting British Belting & Asbestos have supplied their SCANDURA belting for many varied applications. Due to its resistance to contamination and its hygienic qualities SCANDURA has become the obvious choice for food conveyor belting. Its lasting qualities had already been proved in food factories two years before its first introduction in Britain's coal mines in 1948, and its fire resistant properties have brought a hitherto unknown safety margin where conveyor fire hazards originally existed. SCANDURA is available now, in varying widths and thicknesses to suit all applications.

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BRITISH BELTING & ASBESTOS LIMITED · CLECKHEATON · YORKSHIRE

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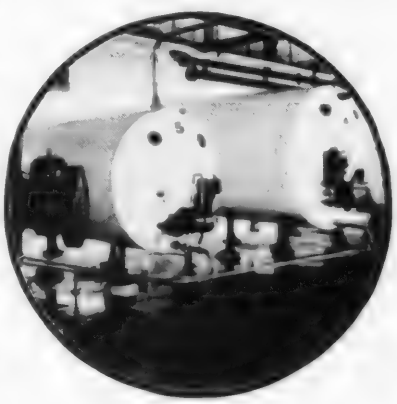
There are no nozzles to clog, high pressure joints or valves to leak; and there is no thermal action which partially destroys the effectiveness of most insecticides. Liquid placed in the container of the Microsol is instantly changed into a fog of selected particle size, and the particles are uniform in size. This factor, coupled with high penetration and a very fast rate of application, ensures control with a minimum of labour, time and material. Microsol may be used with any clean liquid or emulsion, both water or oil based, and is so simple to operate and maintain that it may be safely entrusted to the hands of non-skilled operators.



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Telephone: Chancery 8172/9 Cables: MICROSOL, LONDON.

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How much time do you waste washing Food Utensils and the containers which hold Food products

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These articles must be washed in large quantities *VERY QUICKLY & HYGIENICALLY AT LOW COST !*

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Time lost in washing raises production costs and puts up the price of the product. Dawsons will be pleased to tell you how you can reduce the cost of washing. Dawson washing machines have been supplied to wash an infinite variety of articles of all shapes and sizes.

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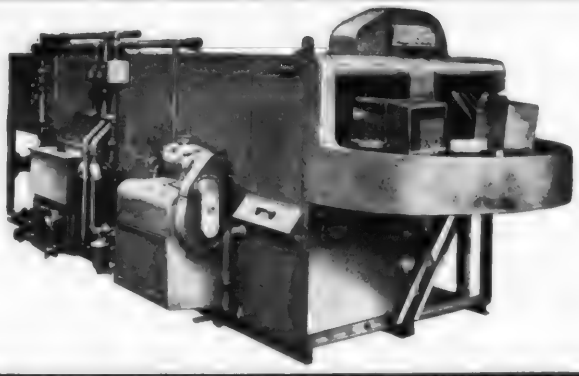
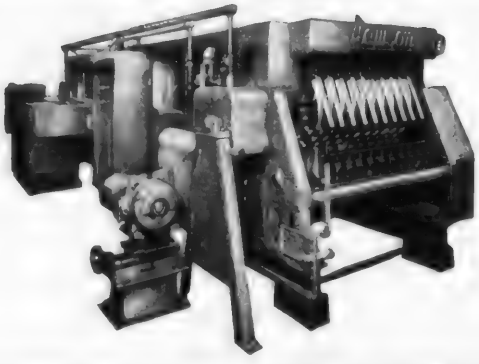
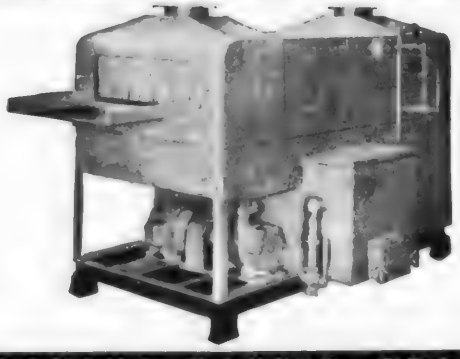


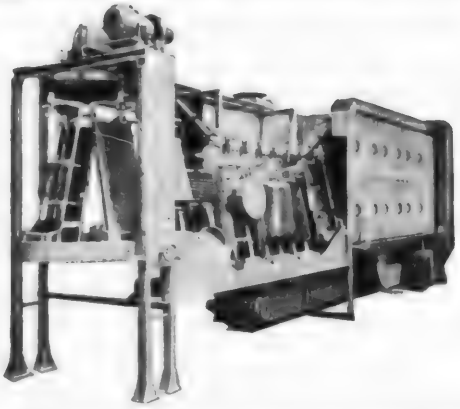
BISCUIT TIN AND CAN WASHER



WASHING BOTTLES AND JARS



WASHING BAKERS TRAYS

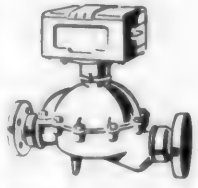


FOOD UTENSIL WASHER

Liquid process control by **MEASUREMENT**

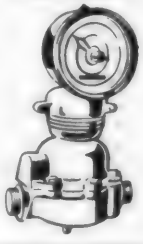
1½" S 7. stainless steel meter with screw on flanges and 12" vertical index.

When you require to measure bulk or batch quantities of edible liquids, oils, spirits and solvents, hot or cold water, we can supply meters with summating, resettable, electrical presettable, direct reading or pointer type index attachments (as illustrated) and control equipment.



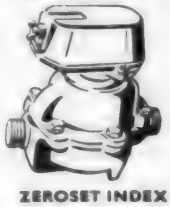
BOX TYPE COUNTER

Re-settable batch-dispensing counter with 7-digit cumulative total register.



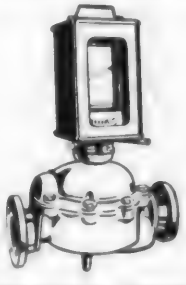
6" VERTICAL RE-SETTING INDEX

Can also be used to pre-set a determined quantity, with electric trip to operate solenoids, pumps, warnings, etc.



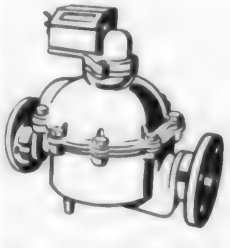
ZEROSET INDEX

Simple turning motion re-sets indicator to zero.



MECHANICAL RECORDER

Gives a graphic record on 5" x 12" chart; suitable for 4 hour, 8 hour, 1 day, 7 day periods



PREDEX CONTROLLER

Automatic means for continuous dispensing of fixed quantities of liquids.

MEASUREMENT

INDUSTRIAL **LIQUID** *METERS*

(A COMPANY OF THE PARKINSON & COWAN GROUP)

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THROUGH your Area Gas Board you can bring the full resources of the Gas Industry to bear on your fuel problem. The Boards' Industrial Gas Engineers are always available for consultation and their services are free. Get your secretary to fill in these details (or pin this advertisement to your letter heading) **and send to your Area Gas Board or to the Gas Council, 1 Grosvenor Place, London, S.W.1.**

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for the bacon curer

I.C.I. GRANULAR SALT is a new grade of coarse vacuum salt, specially designed for use in place of crystal salt for the tank curing of bacon.

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- Lower cost
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ICI

How does production grow?.....

.....with Busy Bees all in a row

Some factories have rows of "Busy Bees" working for them—some have only one. But all agree they keep the wheels turning and production growing. And if you didn't know already, "Busy Bees" is the "nom de plume" of G.E.C. Fractional Horse Power Motors. As if they needed any disguise!

G.E.C. Fractionals

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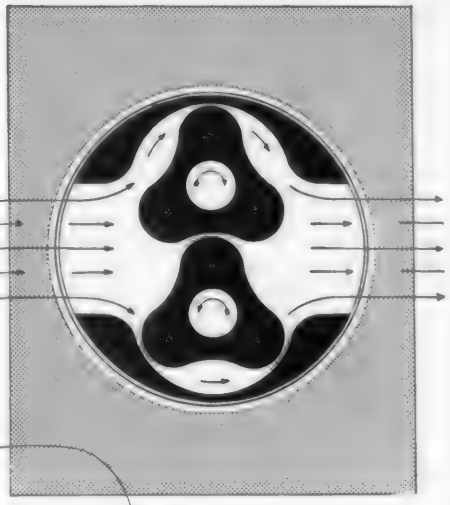
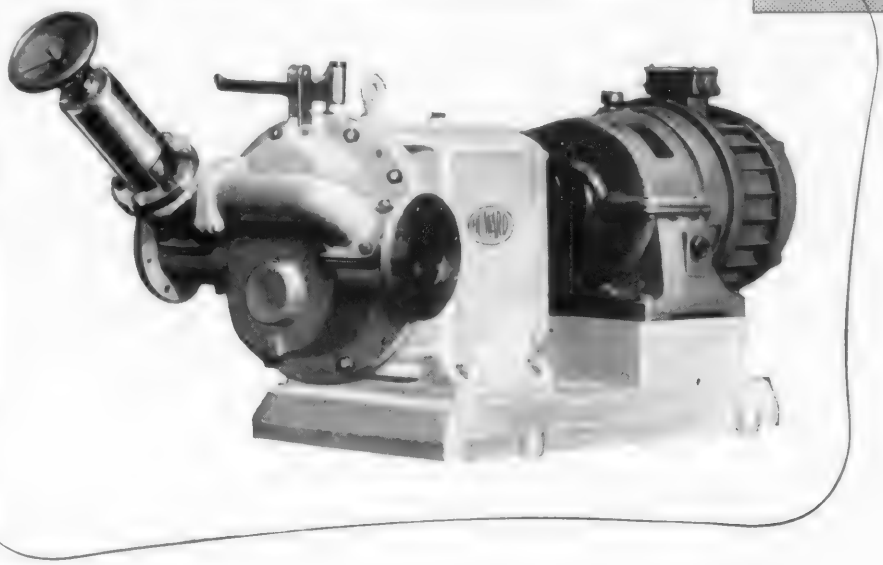
Undisturbed flow ...





When a liquid is very viscous, the most efficient and economical method of transferring it from suction to discharge with minimum alterations in direction of flow is through a Howard Rotary Pump.
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- *Long life with low maintenance charges.*
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A Unit or a Complete Plant

Kellies make 259 individual machines for preparing manufacturing and canning food

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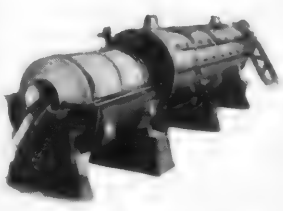
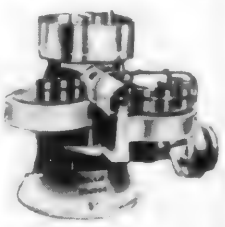
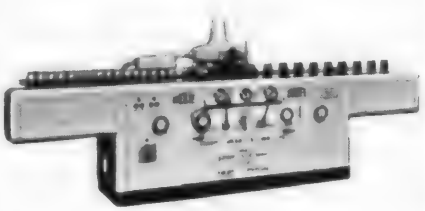


F. E. Continuous Rotary Syruping Machine

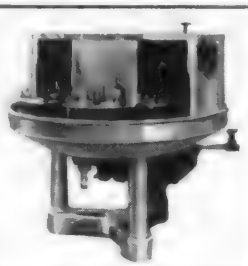


New Auto. Straight Line Filling Machine



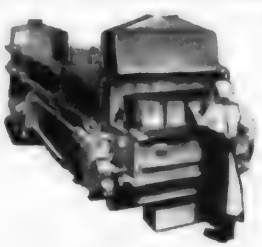
J. B. Quartering, Peeling, Separating and Pulping Machine

Type 6 JJ Continuous Rotary Machine

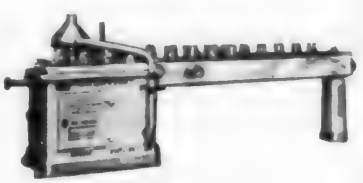


10 Head Auto. Pea and Bean Filling Machine

Type 10 JJ Continuous Washing Machine



7 F. P. Continuous Filling Machine

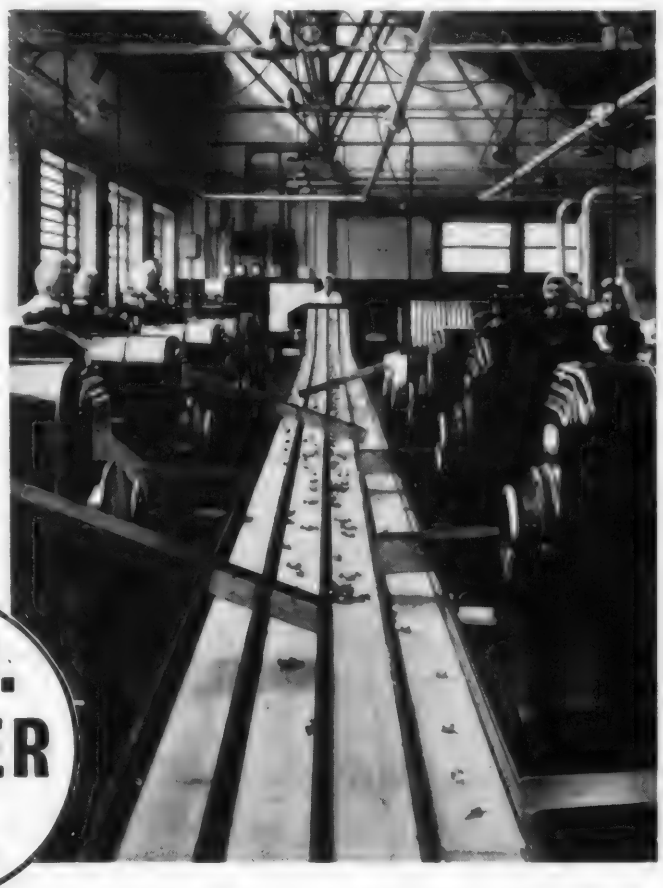


Cut the delay! Speed the flow! with JENNER

Are precious minutes, adding up to hours, lost in the Works through bottlenecks, lack of space, or slow movement between departments?

Jenner Conveyors solve these problems. They knit departments closer together and, in speeding up movement, free valuable floor space.

Cut out delays and speed up production flow by installing Jenner. Every Conveyor is designed and built to meet individual requirements.



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We are specialists in this field and can offer guaranteed natural products which for quality and true flavour are in a class by themselves.

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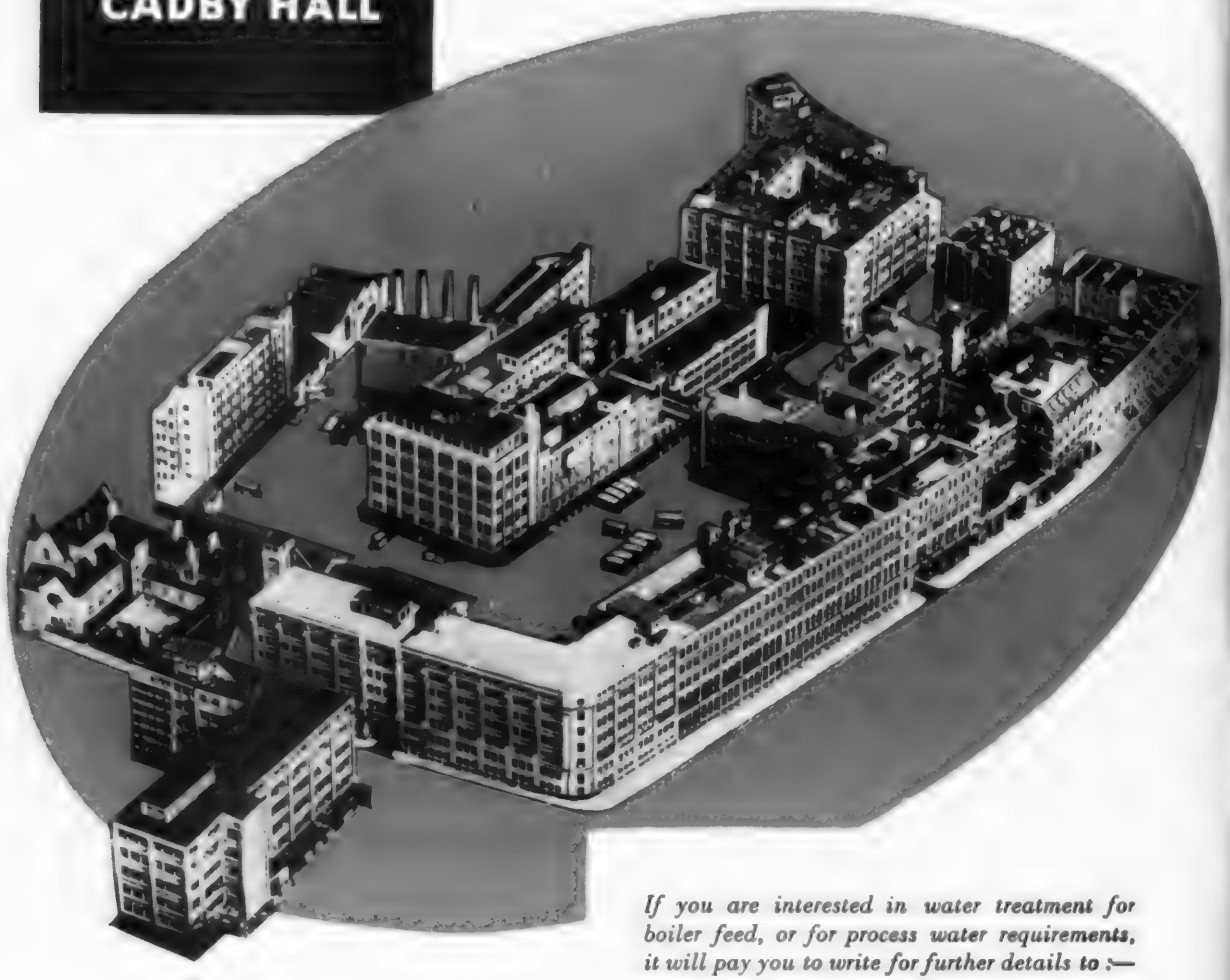
Water Treatment for LYONS at CADBY HALL

The boilers at Cadby Hall, London, provide the process steam required for food preparation on an exceptionally large scale. As continuous, efficient and economical boiler operation is so important to Messrs. J. Lyons & Co. Ltd., they have ensured a perfect boiler feed water by installing Permutit Water Treating Plant. Many other leading firms in the food industry rely on Permutit equipment for this vital function.



If you are interested in water treatment for boiler feed, or for process water requirements, it will pay you to write for further details to :—

The PERMUTIT Company, Limited

London, W.4. Telephone : CHIswick 6431

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We offer a complete range of speciality biscuit flavours which have been devised, as a result of our own research, to stand high temperature work. We shall be pleased to send on request whatever samples you may require for a test batch.
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TAFFORD ALLEN & SONS LTD.
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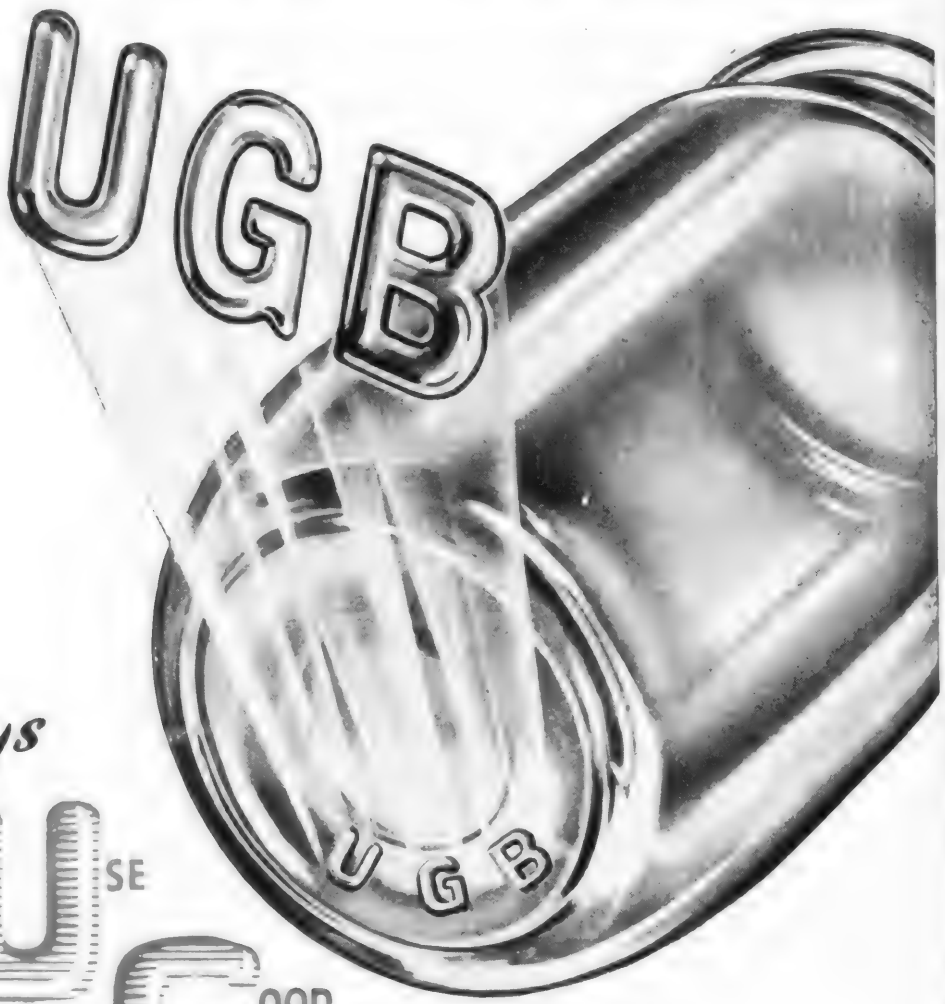
Initials that mean so much in glass



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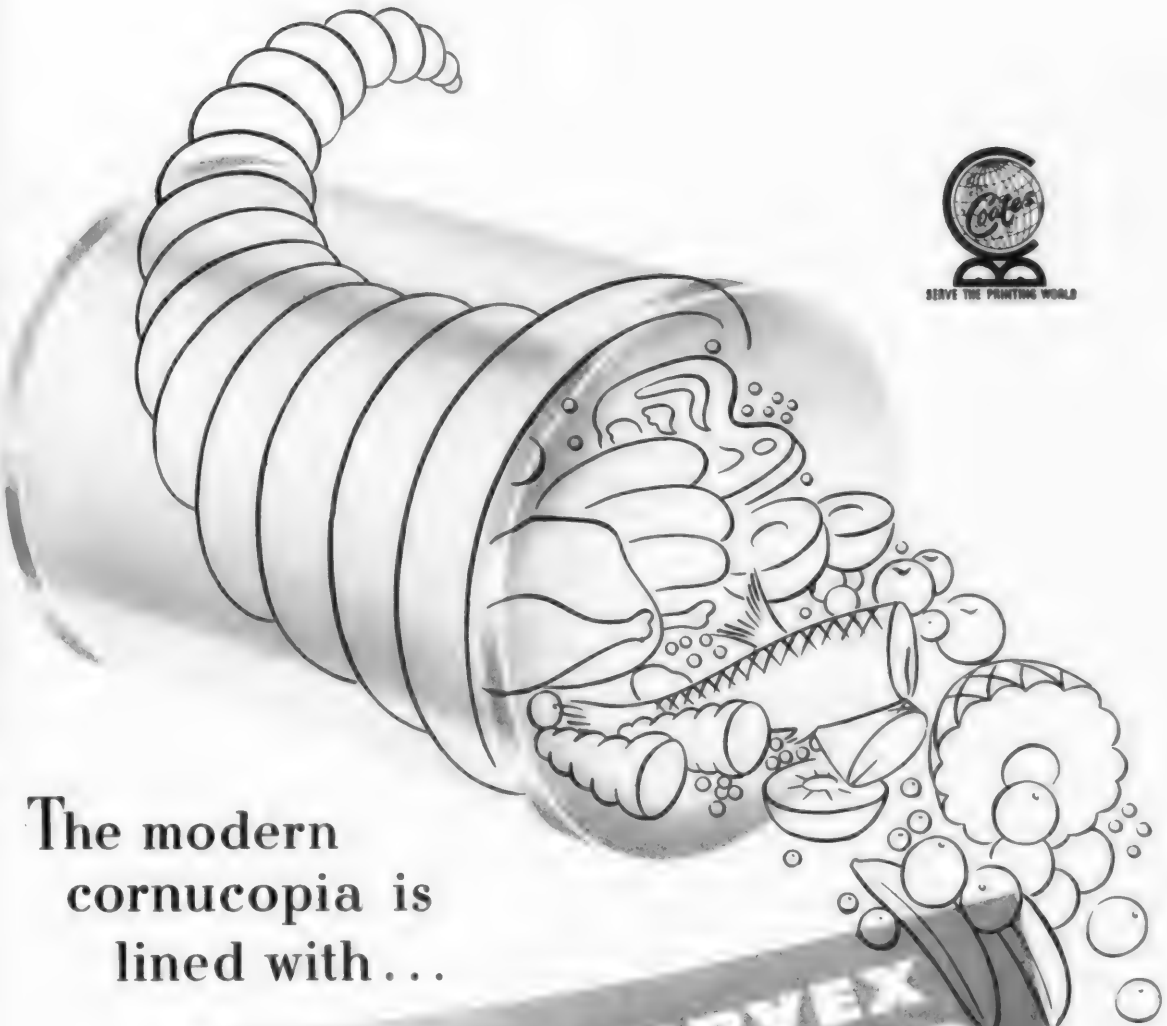
8 LEICESTER ST. W.C.2 - *Telephone:* GERRARD 8611 (18 Lines) *Telegrams:* UNGLABOMAN, LESQUARE, LONDON



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The most satisfactory universal canning lacquer on the market. Preservex M.U. Lacquer gives maximum protection to all kinds of food under the most severe retorting conditions. It adds a decorative finish which attractively sets off the contents. Full stoving details will be sent on request.

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Built to slit straight, fast and true . . .

and stay that way for years

Whether you want to prepare blanks for can body-makers, cut strips for Strip Feed Presses, or trim sheets for litho machines, you can't buy better than Bliss.

These rotary-type machines are engineered to yield consistent, accurate slitter output. Solid one-piece bearings, heavy frames and end thrust bearings combine to give the accuracy you need—and give *it* hour in and hour out over years of steady production.

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BLISS on your machine is more than a name—*it's a guarantee*

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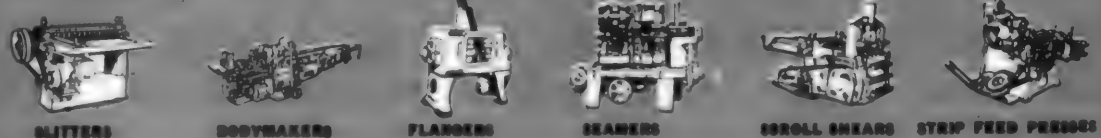
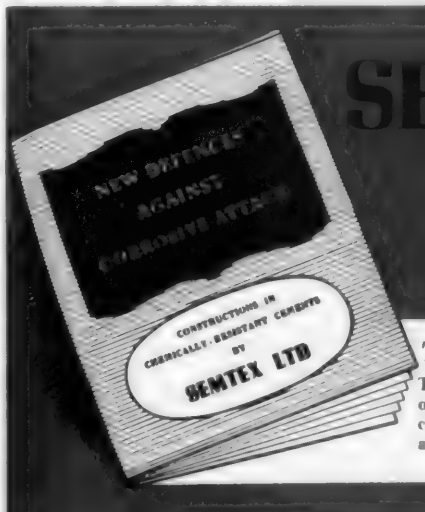


There's a snake in the grass...

The snake in the grass often lurks where all looks well and attacks without warning: its name is corrosion. And yet all conditions which entail corrosive risk—acidic effects, steam, heat, fumes, for example—are in themselves a warning to take defensive action. Happily a final answer to all problems of industrial corrosion is provided by the range of special cement compounds supplied by Semtex Limited. If you would like to have full details of the specialist service provided by Semtex for the construction of flooring and all types of structures designed to keep corrosion at bay, please let us hear from you. Alternatively, if you run your own maintenance unit, full information about these materials—which are of the utmost importance in making installations fully corrosion-resistant—will be sent to you in the form of the illustrated booklet referred to below.

An example of good flooring in a modern food factory. The acid-resistant tiles are bedded and jointed in a special Semtex cement.



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A Dunlop Company

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There's a copy of this informative Booklet for YOU

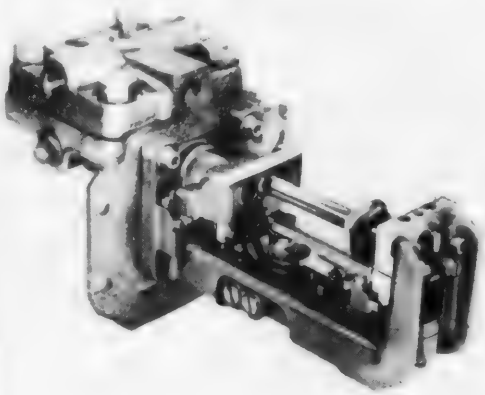
This 28-page photographically illustrated booklet fully describes the Semtex range of corrosive-resistant cement compounds. It deals with the factors governing the choice of the correct cement for the work and gives specification details of each type available. A complimentary copy will gladly be sent you on request.

SPECIALISTS IN INDUSTRIAL ANTI-CORROSION TREATMENTS · FLOORING AND DECKING CONTRACTORS

402/190

Improved **flow measurement and control with the *NEW* BROWN DIFFERENTIAL CONVERTER**

(FROM BRITISH PRODUCTION)



1. **HIGHEST TEMPERATURE RATING** meter body unharmed by process fluid temperature up to 350°F.
2. **INSTANTANEOUS RESPONSE** permitting control with the close tolerances required by modern industrial processes.
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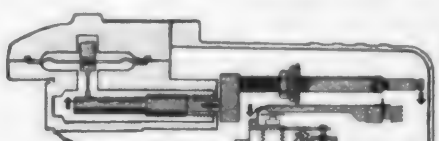
5. **EASY MAINTENANCE** easily accessible components eliminating maintenance problems —save time and labour.

The Brown Differential Converter, a mercuryless type of manometer, operates on the pneumatic-balance principle. It converts differential pressure at the orifice into a proportionate output air pressure which, by means of a pneumatic receiver, is translated directly into terms of flow or differential pressure. Brown Pneumatic Receivers can be supplied either in the form of single, two- or three-pen recorders or single or two-pen recording controllers. These new British Made instruments set a standard of sensitivity and precision hitherto unachieved in the measurement and control of flow. *Further details are available upon request.*



Functional schematic cross-section of the Brown Differential Converter . . . showing its utilization of the pneumatic-balance principle.

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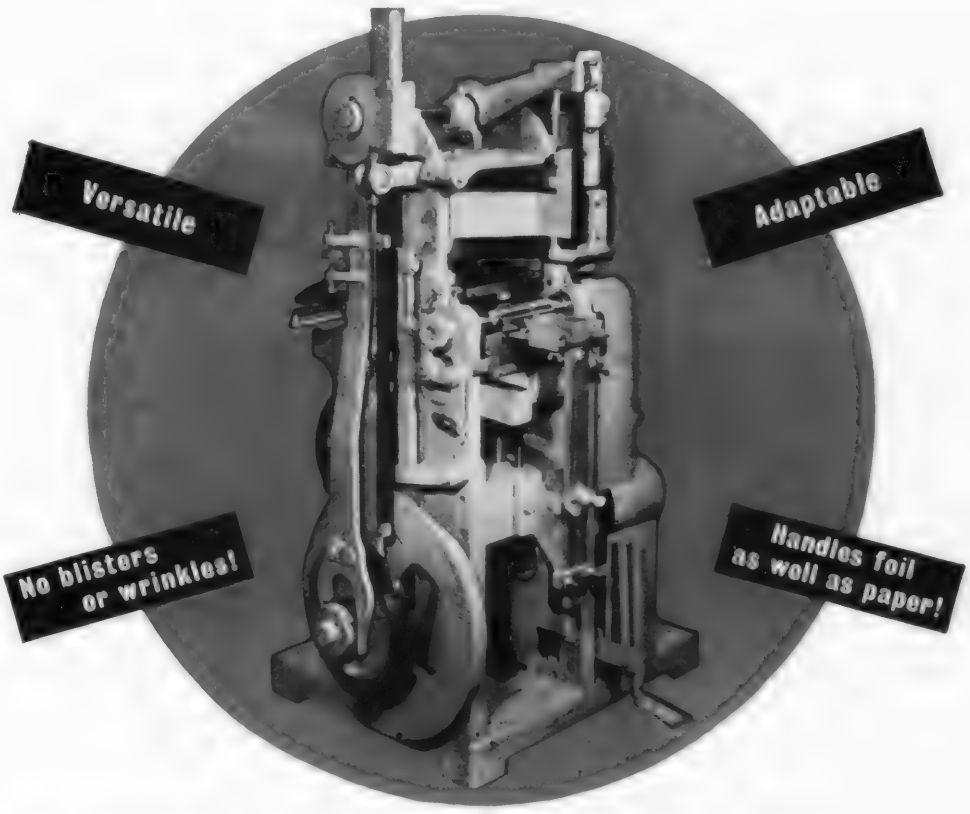
The Pony ✳ has a new stable!



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G. D. PETERS have much pleasure in announcing that they are now the sole manufacturers under licence in U.K. of the complete range of the New Jersey Machine Corporation's PONY LABELRITE Labelling Machines. Able to perform a great diversity of labelling operations at speeds varying from 35 to 60 labels per minute, the PONY machine can cope with an amazing variety of sizes, shapes, in plain, varnished, lacquered or foil labels. Another version of this famous machine is the PONY LABEL-DRI. The original THERMO-PLASTIC Labelling Machine.

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G. D. PETERS & CO. LTD., ENGINEERS, SLOUGH BUCKS, Manufacturers of Packaging Machinery of every description including Capping, Cap-Lining, Lidding, Semi-Liquid Filling, Labelling, Carton Set-up and other machines.

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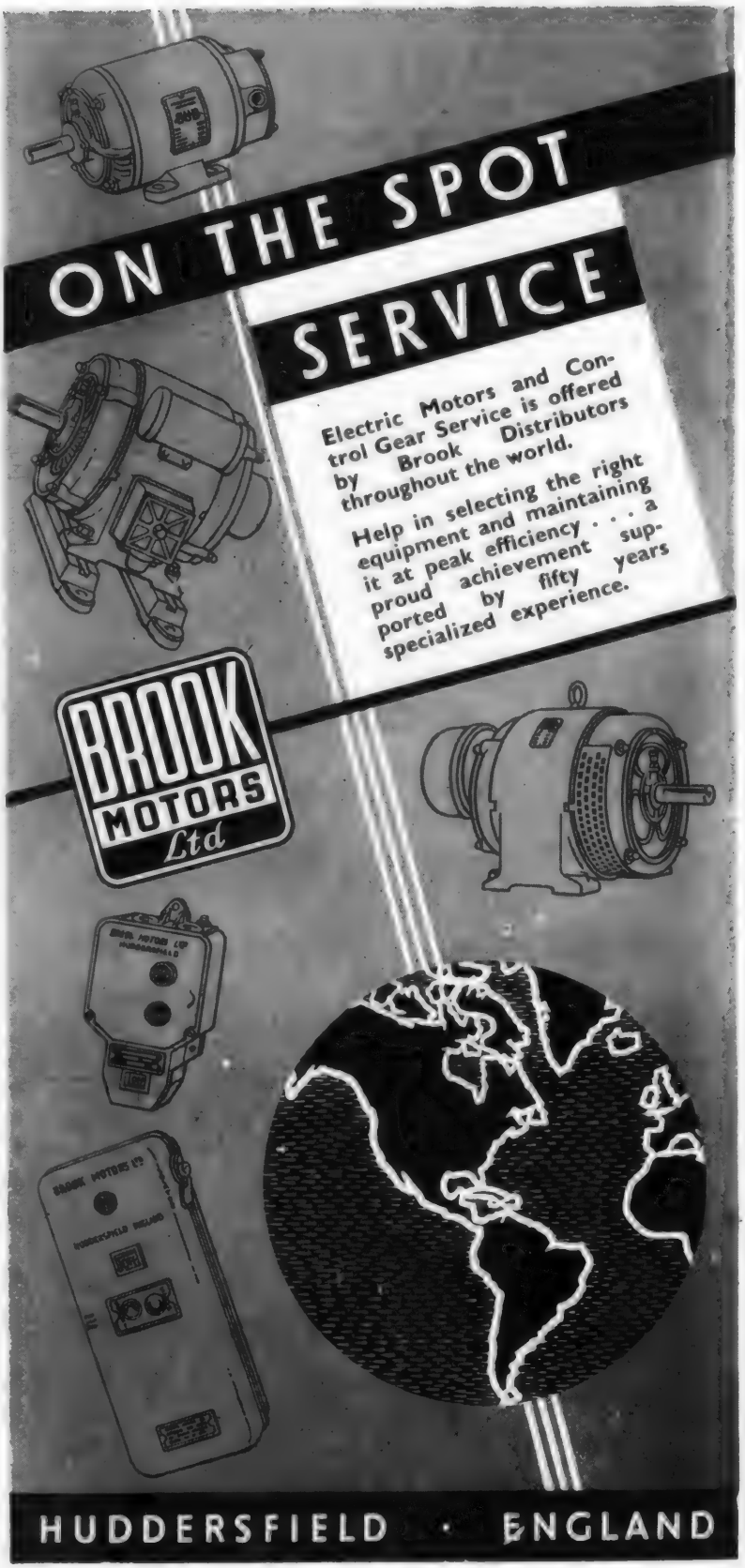
ON THE SPOT SERVICE
Electric Motors and Control Gear Service is offered by Brook Distributors throughout the world.
Help in selecting the right equipment and maintaining it at peak efficiency . . . a proud achievement supported by fifty years specialized experience.
BROOK MOTORS Ltd
HUDDERSFIELD · ENGLAND

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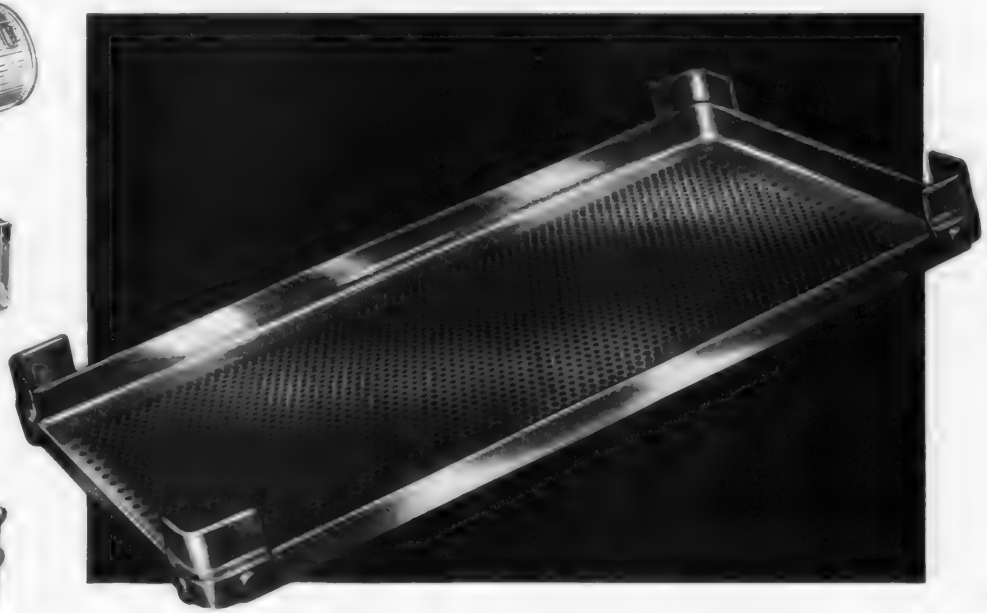
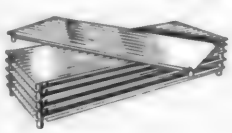
The CHIEF ENGINEER says—

"Give them plenty of air with WARWICK...



...Perforated Trays"



The illustration shows our standard tray T.27151 with perforated base and corner stacking brackets. Many of our extensive range of trays can also be supplied with perforated bases and stacking features—details given on request.

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IN ASSOCIATION WITH **ALMIN LIMITED** FARNHAM ROYAL BUCKS

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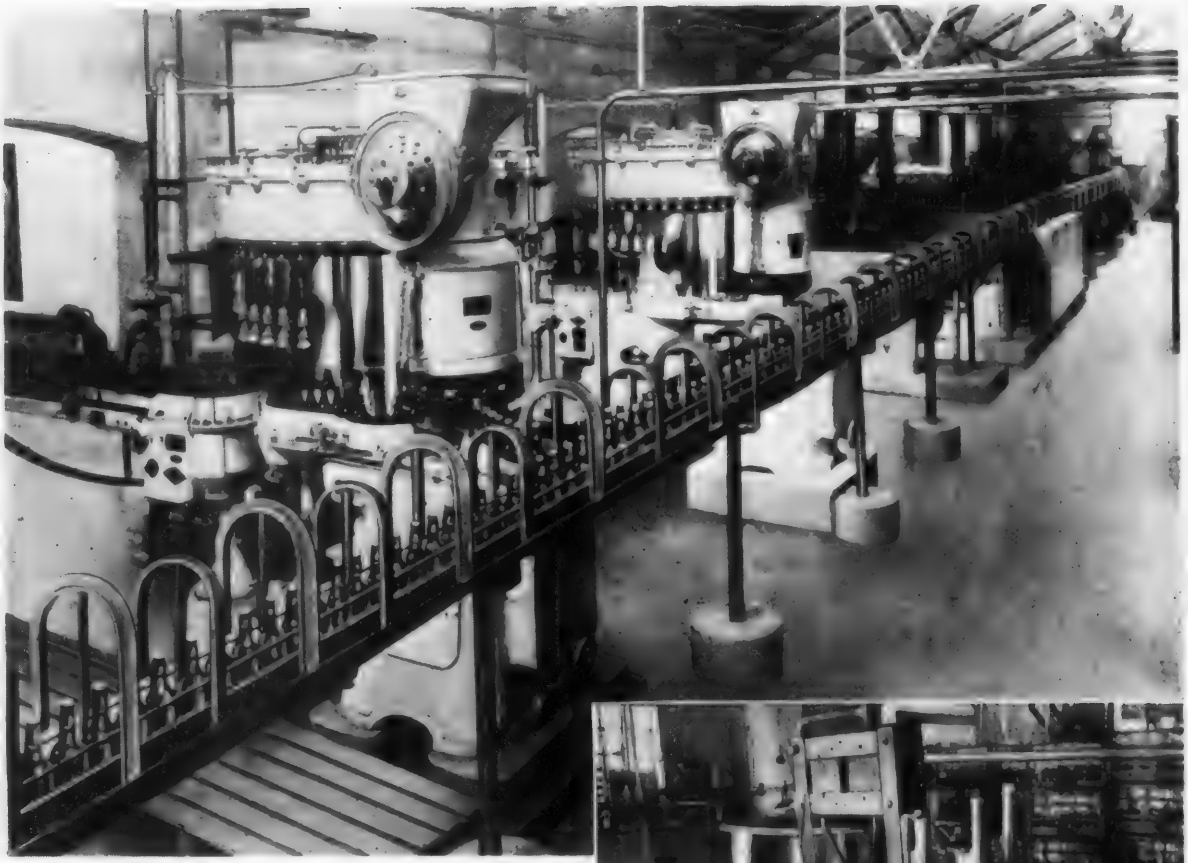

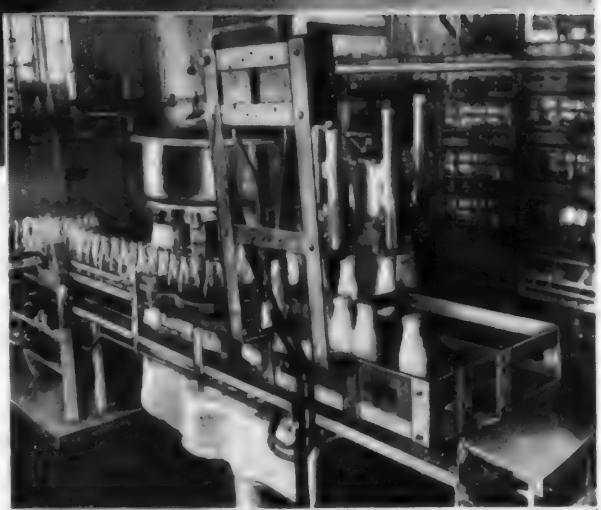

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"Wedco" Woven Wire Belt Conveyors, Universal Chain Conveyors, Aircush Lowerators and Twin Track Lifts are successfully handling bottles and cases for a large number of famous firms with the same effortless efficiency as they handle sausages, automobile parts, fresh fruits, television tubes, etc., for other firms.

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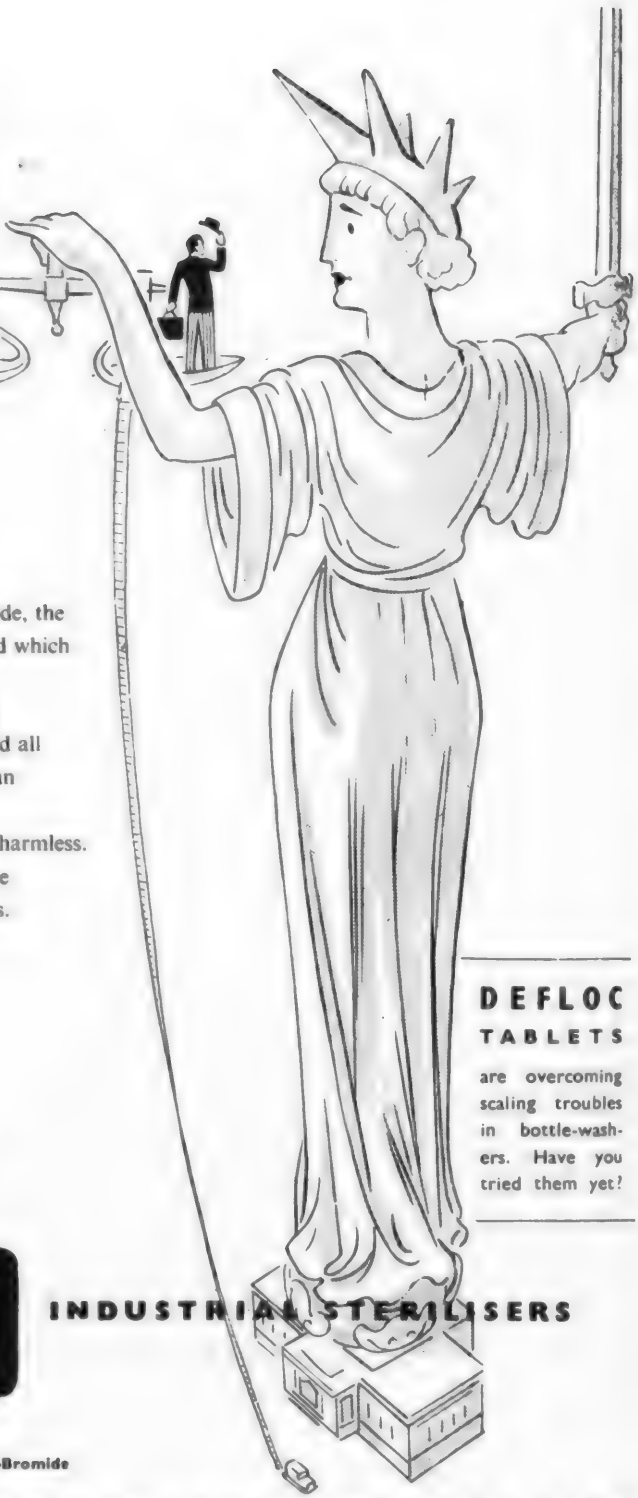
call a National technical service man

RESINS National ADHESIVES

All enquiries to Department "B"

NATIONAL ADHESIVES LIMITED
SLOUGH · BUCKS
TELEPHONE: SLOUGH 23344

In Justice to yourself...



DO YOU KNOW...

that highly efficient sterilisation for the food industry is now possible without steam, boiling water, etc. B.H.C. pioneered DECIQUAM; a preparation of Didecyldimethylammonium bromide, the new twin chain quaternary ammonium compound which is highly active against a wide range of micro-organisms, including yeasts and moulds. Having a high wetting power, it is ideal for sterilising cold all types of plant in the food industry. Deciquam can be used in high dilutions and still retain its bactericidal power. It is tasteless, odourless and harmless. Another important feature is that it does not have any corrosive action upon metal or other surfaces. Ask for a B.H.C. Technical Representative to call and advise you on its advantages.

Just a reminder that you can STERILISE COLD with

DECIQUAM AND DECIQUAT

Preparations of
Didecyldimethylammonium-Bromide

DEFLOC TABLETS

are overcoming scaling troubles in bottle-washers. Have you tried them yet?

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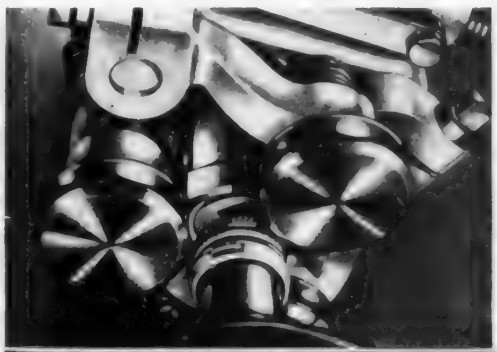
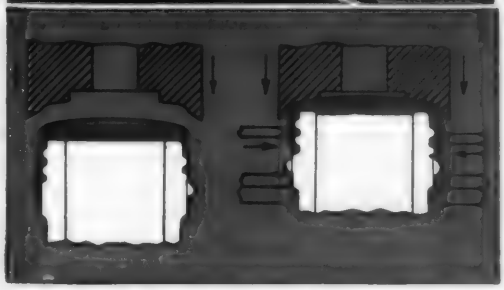
Associated Companies: Colloidal Detergents of Australia Ltd., Sydney, Australia: Chemical Services (Pty.) Ltd. Johannesburg. And at Copenhagen, Amsterdam, Brussels, Paris, Lille, Lyon and Ober-Winterthur, Switzerland.

The 'MADE-TO-MEASURE' *closure*





For closures no less than clothes perfect fit is essential. By means of a sealing machine the R.O. Seal is virtually *rolled on* to the container and moulded under pressure to the individual screw thread on which it sits, thus ensuring a true "made-to-measure" fit. R.O. Seals have been adopted to ensure factory-fresh sealing by numerous manufacturers of world famous products. Modern in design, R.O. Seals are available in colour or embossed. Why not write for samples and free descriptive brochure.

PLAIN OR PILFER PROOF

R.O. seal

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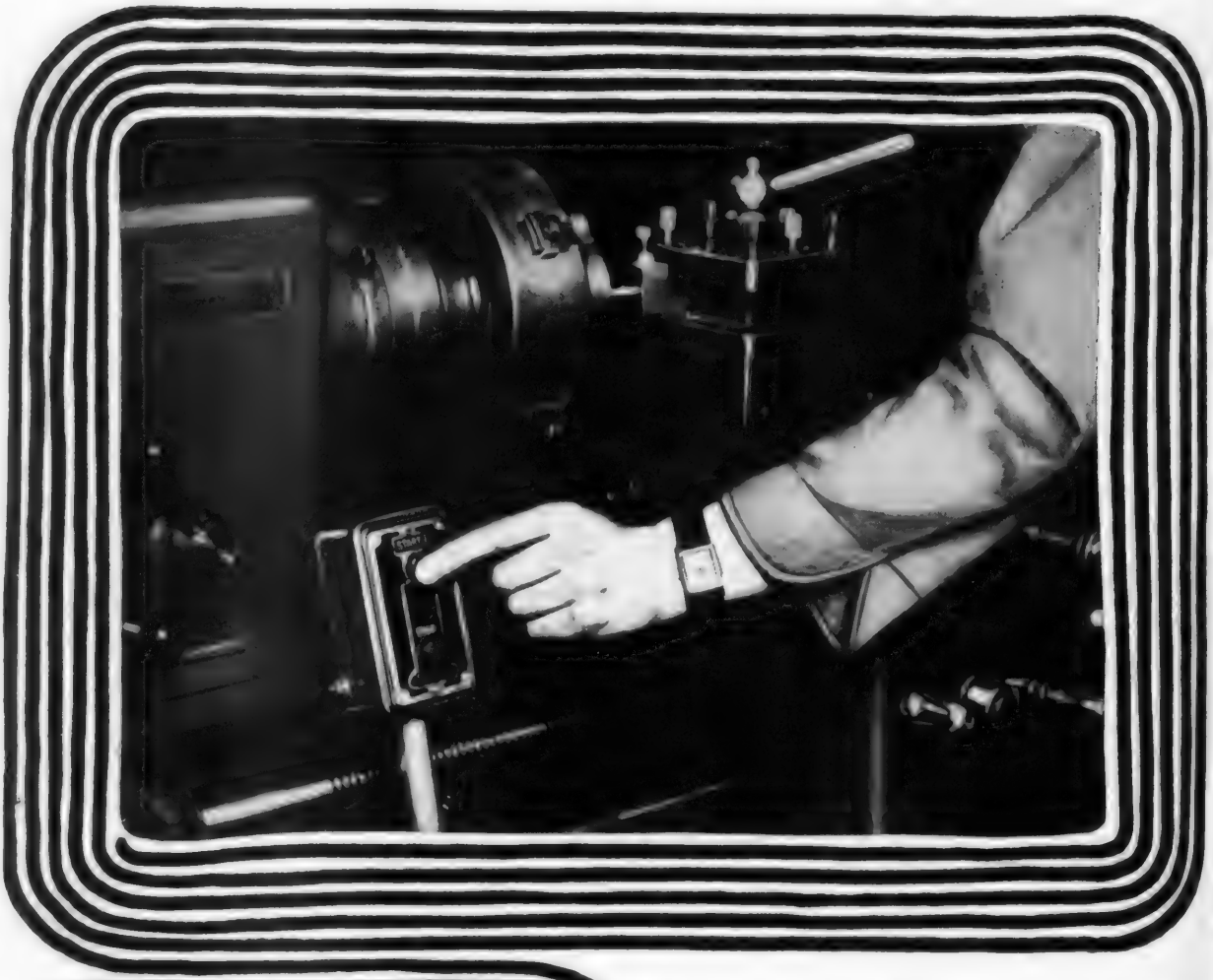
Having a hand in Productivity



The Finger on the Button

And the eye on the job—the brain too. The machine under the control of a button, the man free to use all his skill. Working without worry, without distraction, a man can work faster, less tiringly.

The machine is a lathe, set up for boring. Accurate work, careful work, but the push button can make it fast work. The hand on the button is symbolic. By freeing skill from unnecessary distractions, electric control speeds up production, raises productivity—and lowers costs and improves accuracy. Push button control is ONLY ONE OF THE AIDS TO HIGHER PRODUCTIVITY THAT ELECTRICITY CAN BRING YOU.

The British Electrical Development Association
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IN EVERY INDUSTRY OR TRADE, electrical equipment is the key to modern production methods. There are probably more production-boosting and money-saving devices than you know of. Your Electricity Board can help you and give you sound advice.

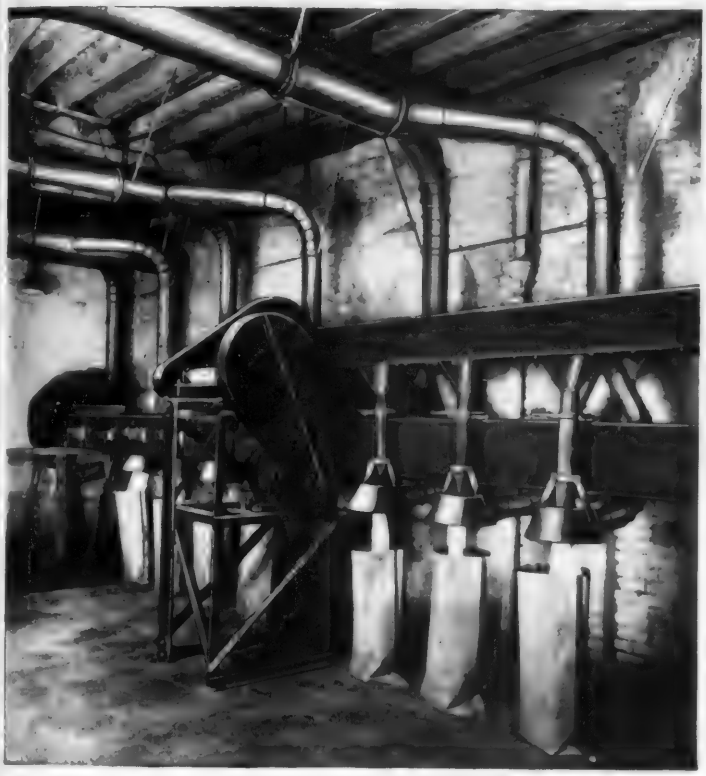
They can also make available to you, on free loan, several films on the uses of electricity in Industry—produced by the Electrical Development Association.

E.D.A. are publishing a series of books on "Electricity and Productivity". Four titles are available at the moment; they deal with Higher Production, Lighting, Materials Handling, and Resistance Heating. The books are 8/6 each (9/- post free), and the Electricity Boards (or E.D.A. themselves) can supply you.

Electricity
a Power of Good for PRODUCTIVITY

Sturtevant

DUST EXHAUSTING SYSTEMS



. . . comprising the most up-to-date equipment, are being installed in ever increasing numbers to prevent dust rising and dispersing from finely powdered or granular materials during handling and processing, and ensure cleaner and speedier working of the machines.

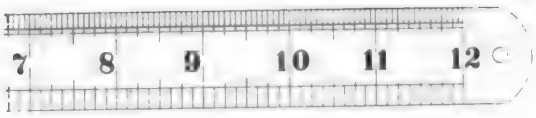
The separation of dust by various methods such as cyclones, textile filters and other apparatus is carefully studied to provide the most satisfactory solution to any problem.

There is no guesswork about Sturtevant Dust Collecting and Conveying Systems—**if you have a problem, write for full particulars and publication No. W.6505.**

The above illustration shows part of a Sturtevant Dust Exhausting plant applied to the filling of powder into paper bags.

Sturtevant **ENGINEERING COMPANY LIMITED**

Southern House, Cannon Street, London, E.C.4



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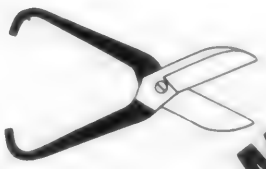
We have always specialized in "tailor made" metalwork to meet the specific needs of the Food Industry.

We should therefore, be glad to quote for any equipment you require in steel, copper, brass, aluminium or stainless steel in the form of sheet, plate, tube, perforated metal or wirework.



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Palace Street, Plymouth. TELEPHONE: 2261

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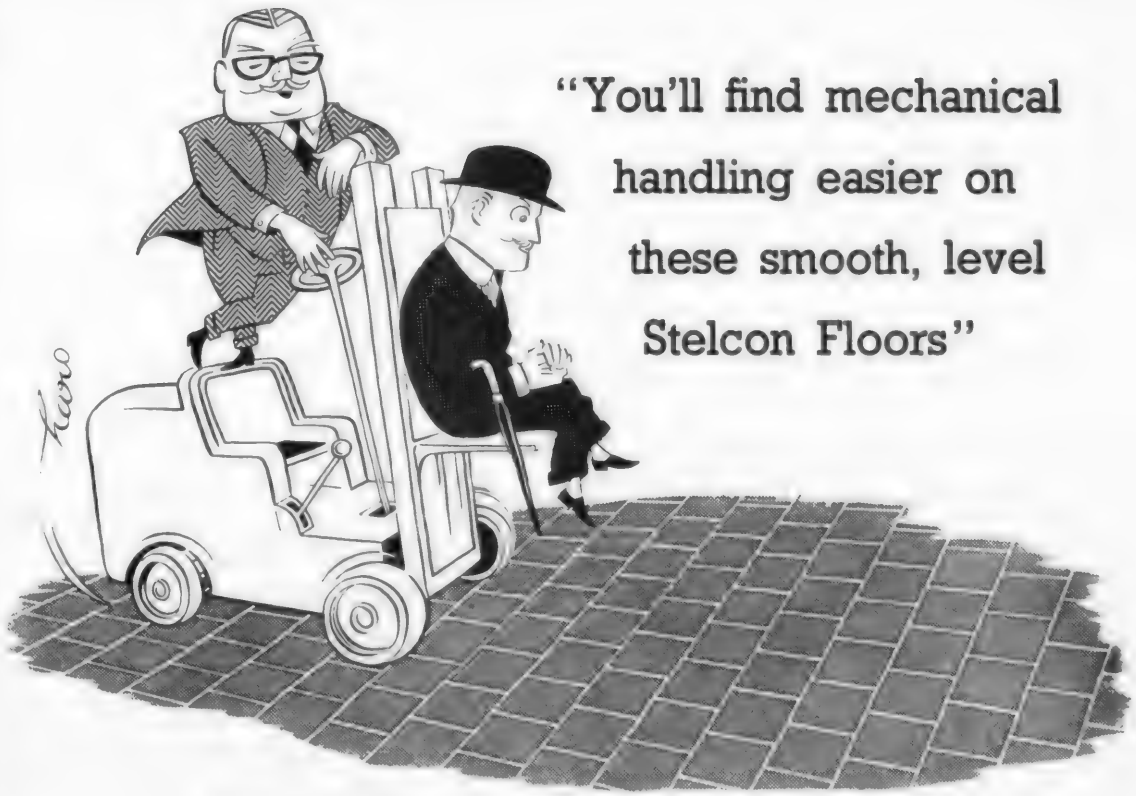


"You'll find mechanical handling easier on these smooth, level Stelcon Floors"

Modern mechanical handling works best when floors are smooth and even. You can carry maximum loads without mishap. That's why more and more industrial concerns are installing Stelcon Floors — they like things to run smoothly all the time.

Stelcon Anchor Steel Plates and Steel Clad Flags also provide dustless, hygienic floors of great strength and durability. Full details sent on request.

You'll find

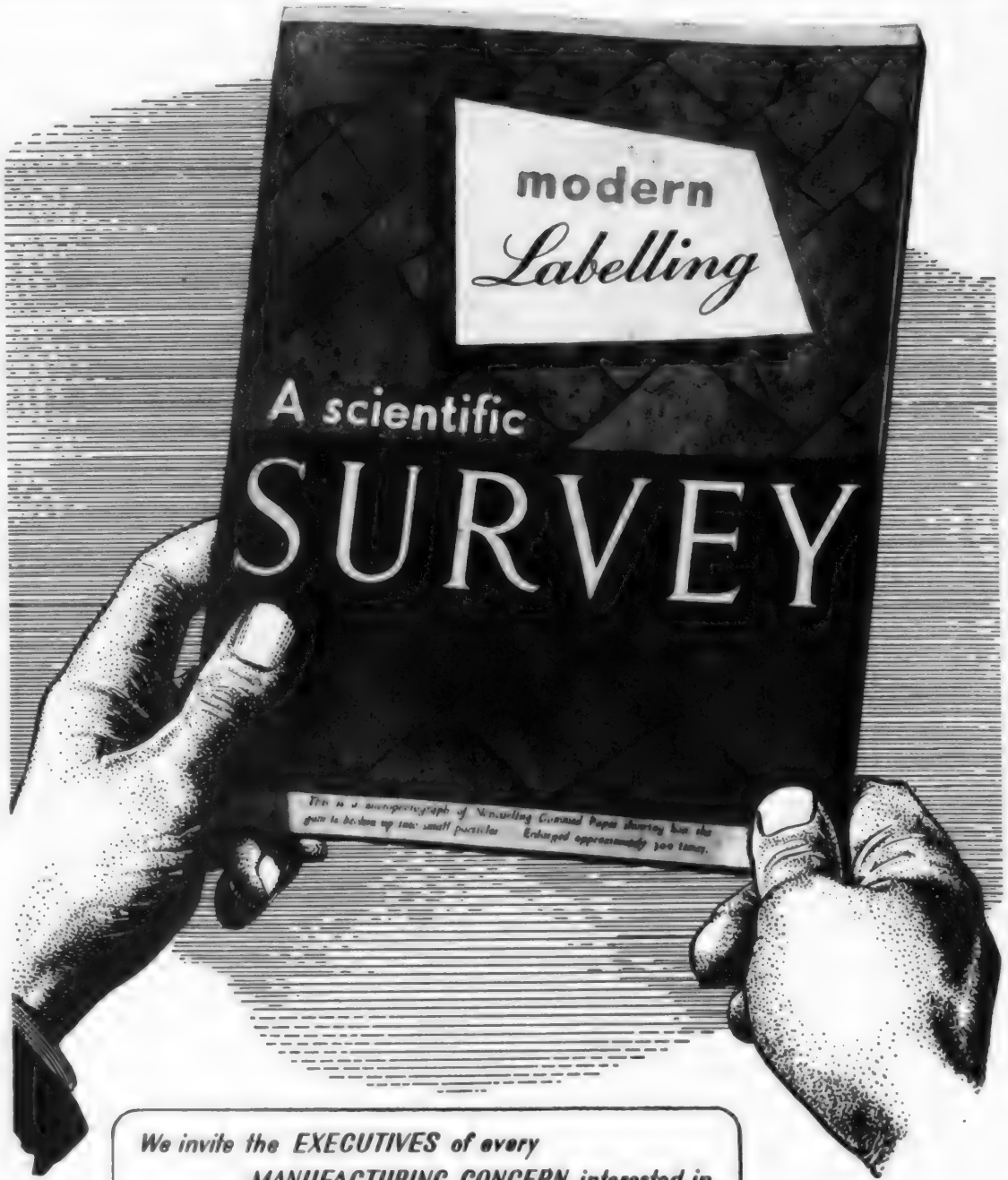
Stelcon

FLOORS

in every industry — everywhere

To satisfy the requirements for a non-dusting, level surface, Stelcon Anchor Steel Plates were chosen for the floor of their new Strip Mill by Messrs. Firth Vickers Stainless Steels Ltd., Sheffield.

STELCON (INDUSTRIAL FLOORS) LTD., CLIFFORDS INN, LONDON, E.C.4. TELEPHONE: HOLborn 2916



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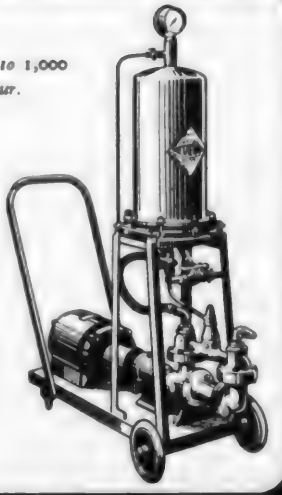

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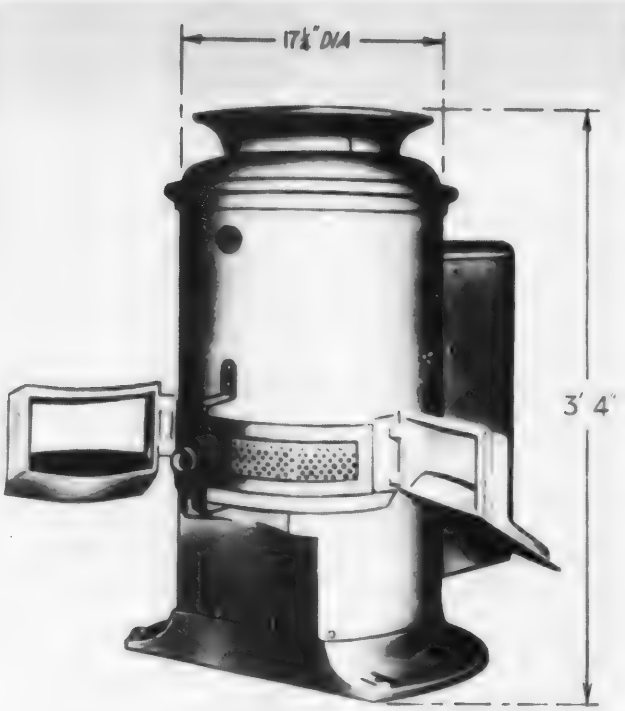

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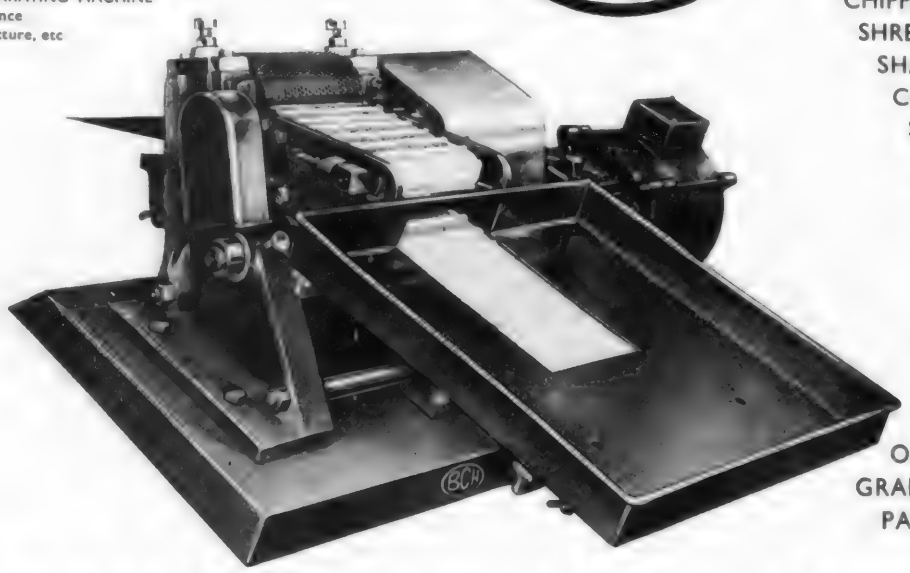

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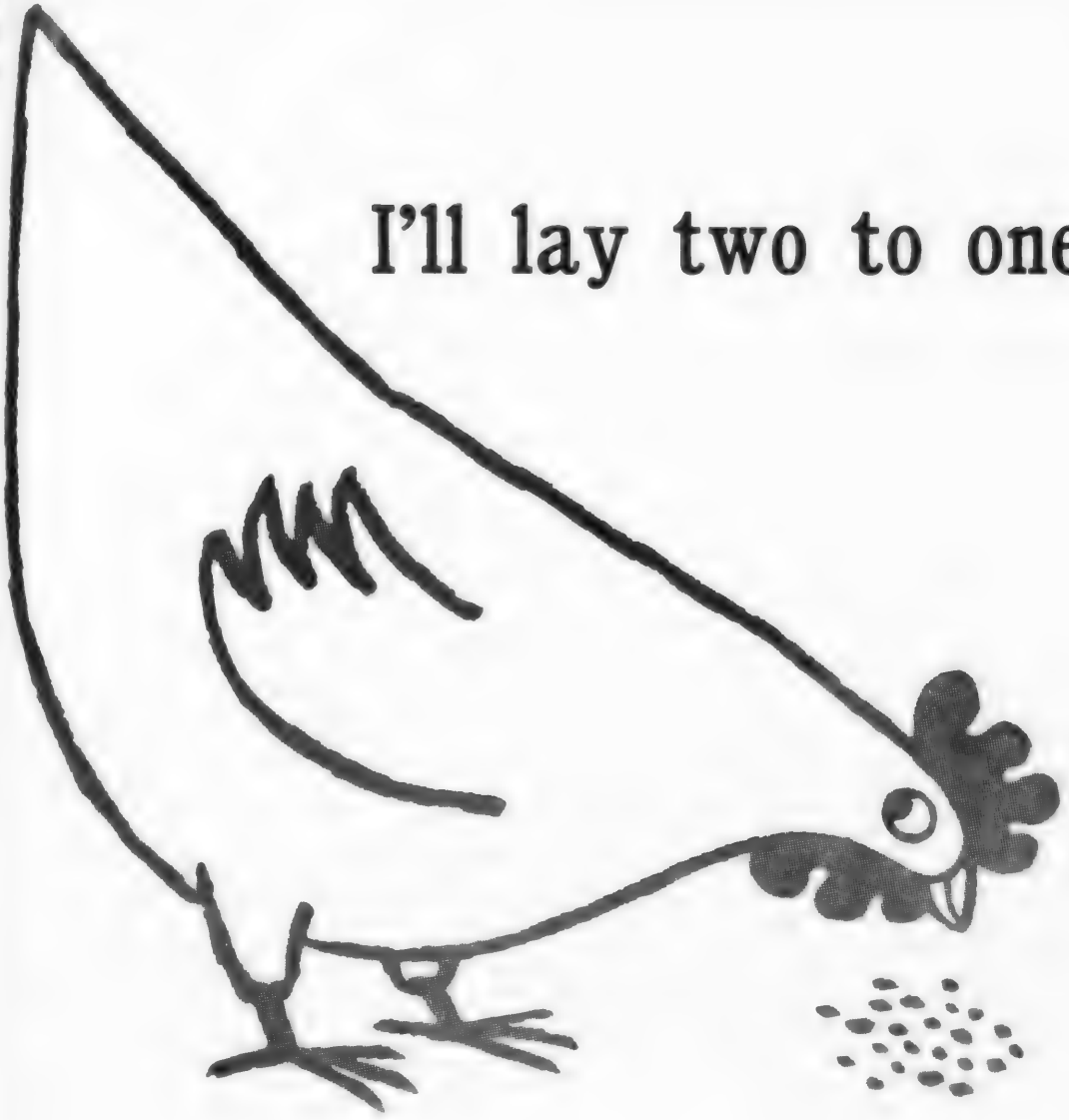

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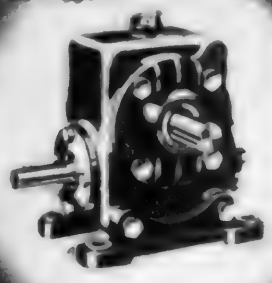

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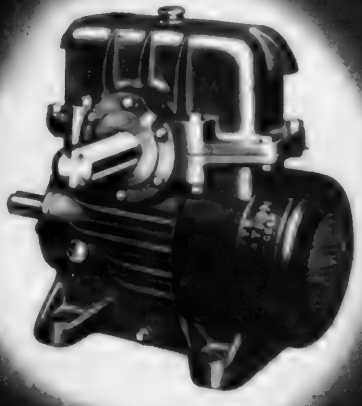

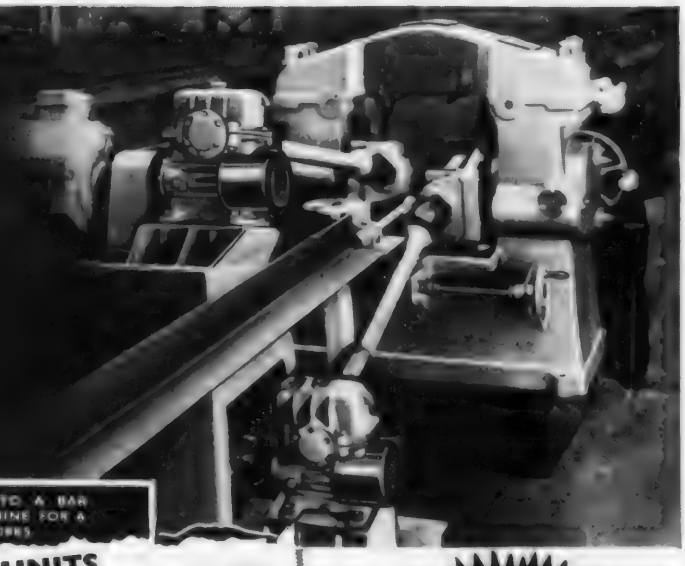

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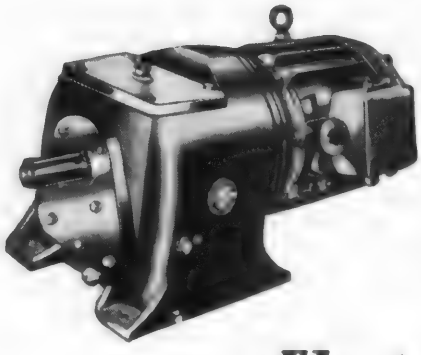

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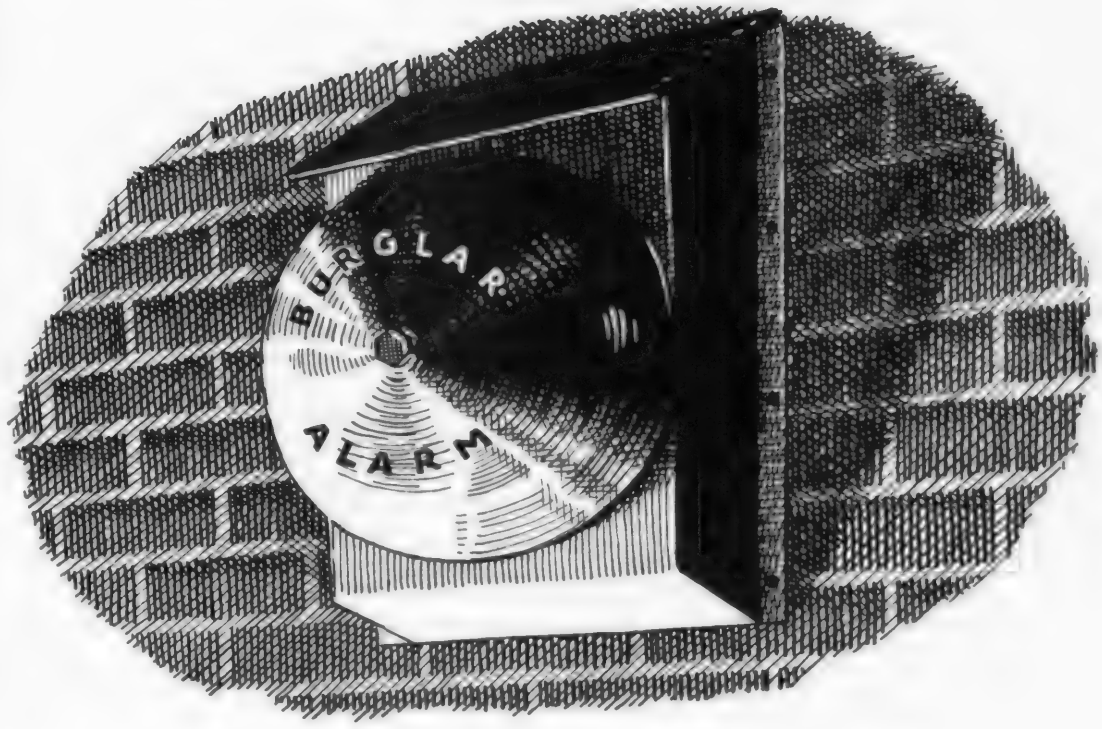

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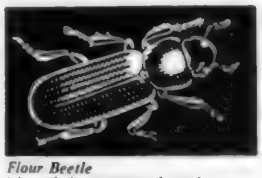

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(Actual size approx. 4 mm.)

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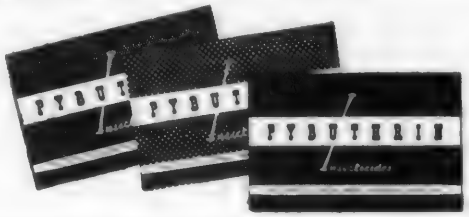

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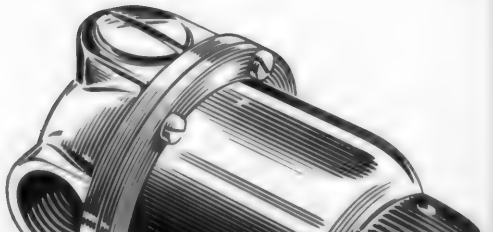

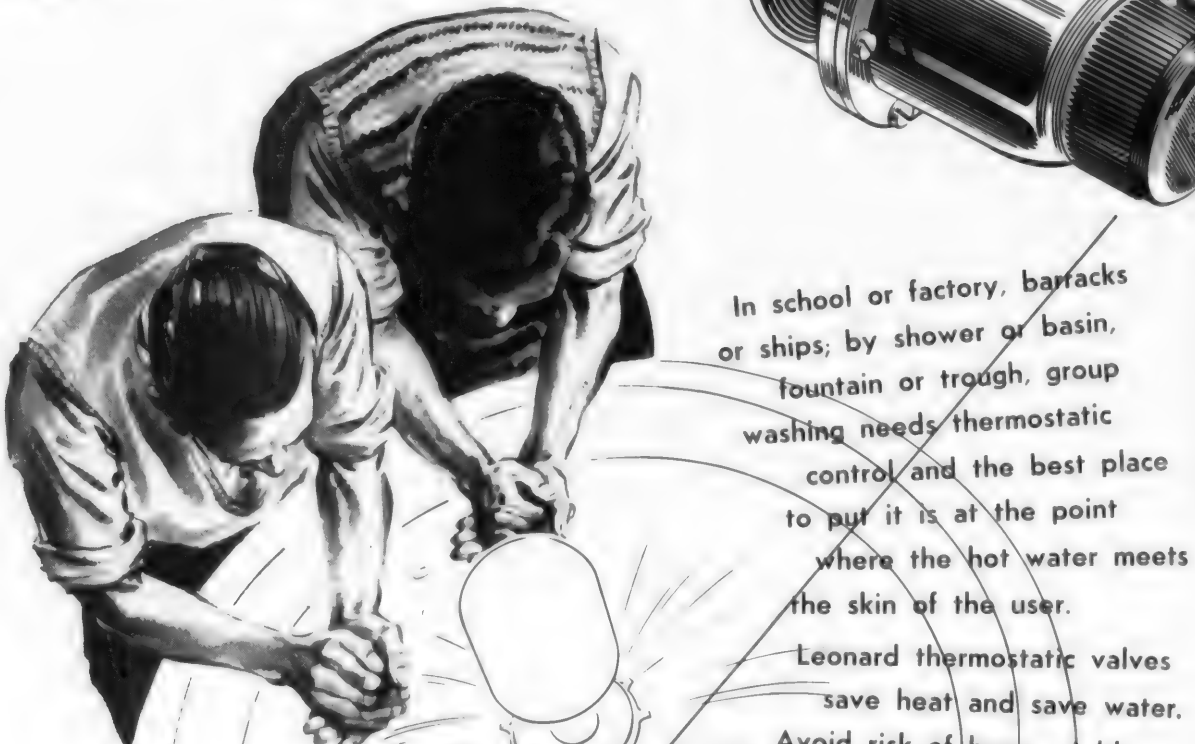

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FOOD MANUFACTURE

Vol. XXIX. No. 7 • Published Monthly • July 1, 1954

CONTENTS

	Page
Editorial	255
Gelatin—From Raw Material to Finished Product	259
Recent Advances in the Biochemistry of the Proteins. *A. E. Bender, B.Sc., Ph.D., F.R.I.C.*	265
The Composition of Food	269
Correspondence	269
Making Known	270
A Milk Substitute from Groundnuts. *V. Subrahmanyan, M. N. Moorjani, and D. S. Bhatia*	271
Progress with Quaternary Ammonium Compounds. *J. C. L. Resuggan, F.R.I.C.*	277
Abstracts from Recent Food Literature	279
Cider Sampling Day, 1954	281
News from the Industry	282
Information and Advice	294
Recent Patents	295
Trade Marks and New Companies	296

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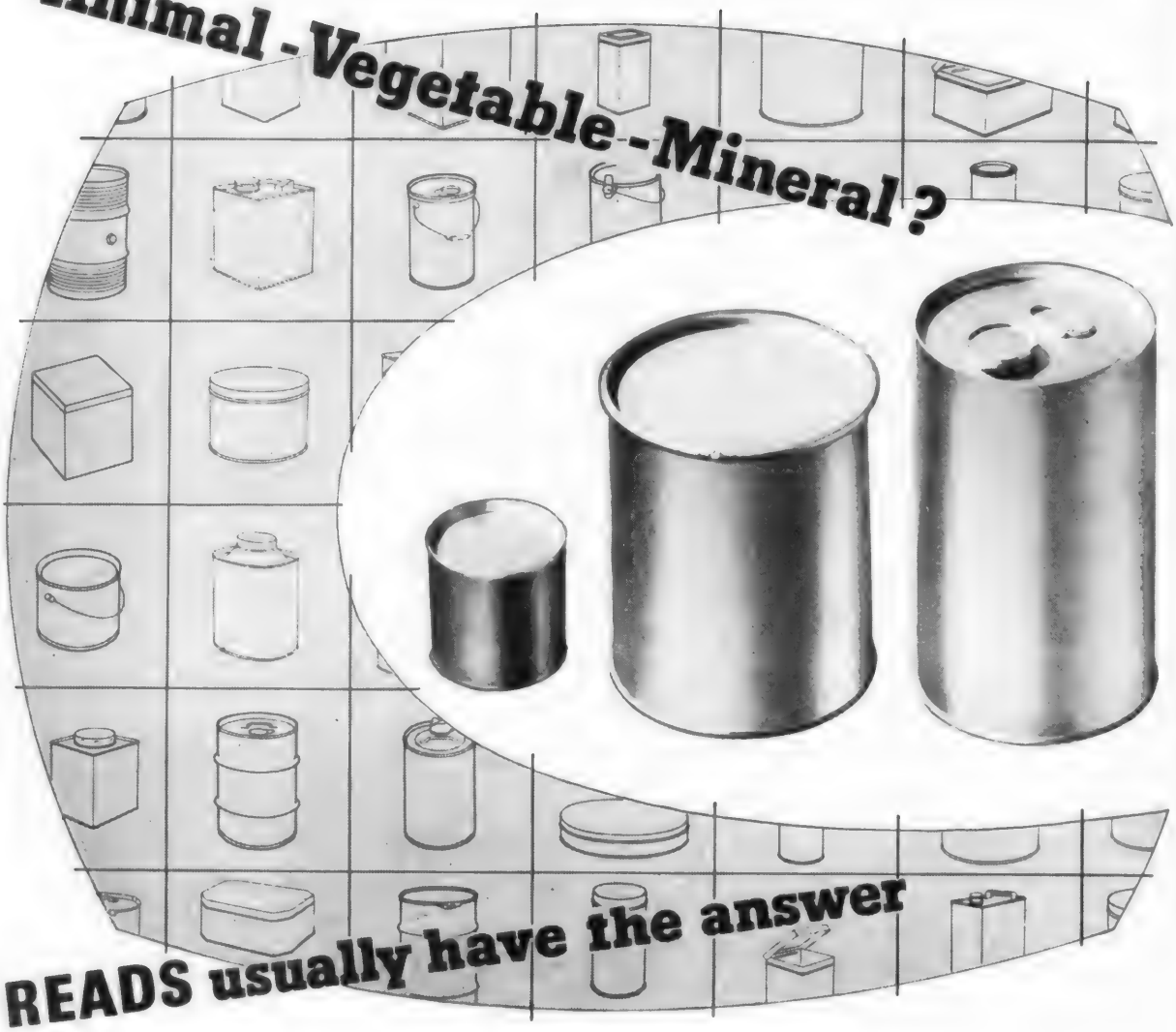

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FOOD MANUFACTURE

Vol. XXIX, No. 7 July 1, 1954

Decontrol of Meat

AT a recent conference of the National Federation of Meat Traders' Associations, the Minister of Food, in his address, covered a large range of subjects pertaining to the derationing of meat. After tracing the history of the meat control scheme over the past 14 years, he went on to speak of the coming situation, and said:

"We shall all of us have to be ready to overcome inevitable teething troubles which will follow decontrol. We are, in fact, planning not so much a return to the pre-war system as we knew it, as for decontrol under new conditions, and this inevitably brings new problems in its train."

Discussing the supply position, which had steadily improved since the end of the war, the Minister said that the Southern Dominions continued to be our principal overseas suppliers. Australia appeared to have shaken off the effect of the drought which had so severely reduced her exportable surpluses of meat during 1951 and 1952, and New Zealand supplies continued at a level substantially higher than that of the pre-war years. It had been the general improvement in our balance of payments position and the contribution of our home producers that had influenced the decision of the Government to put an end to the system of meat control and rationing in the summer of this year. Not everyone was satisfied with the timing of the operation, but it was the Minister's opinion that the control scheme would have proved unworkable had it continued throughout the flush period in 1954.

Mentioning some of the major problems that would confront the industry as well as the Ministry in July, the Minister said that his Ministry could not step right out of the business of control. For one thing, the farmers must receive their guarantees under the 1947 Act, and for the time being the Ministry of Food would have to implement those guarantees. To this end, they had endeavoured to devise a system which would give farmers the security they needed, while at the same time allowing the market price to provide the all-important reflection of consumer preference for quality and type of meat.

Referring to the controversies which raged all last summer about the best system of marketing meat—some favouring the system of selling "on the hook," others that of selling "on the hoof"—the Minister said that the arrangements which the Government had devised would permit both types of marketing activities to be carried on.

From the date of decontrol, the farmer would be able to sell his stock when and where he liked, and the butcher and wholesaler would be able to buy under the same conditions. Auction sales, private treaty sales, live sales, deadweight sales, and sales by grade would all operate, and if there were any other kinds of sales which he had not covered, he had no doubt there would be a place for them too!

If the farmer wanted to qualify for his guarantee, he would have to bring his stock to a certification centre so that the facts necessary to assess the guarantee payments could be recorded. There would be a large number of these centres, including about 700 livestock auction markets where stock sold alive by auction or private treaty would be certified for the guarantees.

As to the Slaughterhouse Bill, this would make local authorities responsible for ensuring that sufficient slaughtering accommodation would be available on decontrol, for they were more fitted than central Government departments to assess local needs and to consult local interests. Butchers themselves, however, in the main, would have to provide the additional facilities, subject to the licensing powers of the local authority and, in turn, the local authority would have to rely on butchers or wholesalers for information about local conditions.

On the question of compensation for the closure of private slaughterhouses where there was adequate public slaughtering accommodation, the Minister said that the Government was prepared to contribute a 50 per cent. grant towards compensation paid by local authorities in these cases. This was a charge which would become due as a result of the efforts to make improvements gradually during a period of some years and these improvements would, in many ways, be in the interests of the Public Health requirements of local authorities. It was a charge, therefore, which the Government considered should be borne equally by local authorities and the Government and should not fall entirely on either of these parties.

Listening in for Fish

AN interesting form of co-operation between coasting and fishing interests in the North of Scotland has been set up by the Herring Industry Board and the North of Scotland, Orkney and Shetland Shipping Co. The latter's *St. Clair* has been making regular echo-sounding recordings on the trip between Aberdeen and Lerwick to assess the presence and extent of shoals in the main fishing grounds. This information has been passed on to skippers and has proved of considerable value.

To increase the effectiveness of this system, arrangements have now been made whereby the information will be made immediately available to the fishing fleets, thus eliminating any time lag. The *St. Clair* is being fitted with radio telephone equipment enabling broadcasts to be made continuously as recordings are taken, so that maximum advantage can be taken of the data obtained.

Starch Production in Australia

IN a short review of starch production in Australia, W. Honsch, Ph.D., A.A.C.I. (*Food Tech. in Aust.*, **6**, 3, 113), points out that the main raw material is wheat, whereas America and Continental countries depend largely on maize and potatoes grown in the first place for stock feed.

The reasons for this are firstly that the Australian maize growing areas are not within easy reach of transport, as in the United States, but are situated in the North of Queensland and some isolated spots in New South Wales, whence the maize is shipped to the starch factories in the capital cities. The uncertainty of transport adds considerably to the cost of the raw material, so much so that corn starch is about twice as expensive as wheat starch. Secondly, in the early days of the wheat industry, starch was regarded as a waste material from wheat gluten; this approach still exists in the industry and accounts for various peculiarities in the construction and management of wheat starch factories in Australia.

The Australian starch industry has a long way to go, having yet to find an economical basis commensurate to its size and the demands of its markets. It also must find, or develop, the equipment to suit its small output, since none of its units is large enough to work on a scale comparable to the corn and potato starch industries overseas.

Following new trends in the American corn starch industry, imported concentrating equipment has been installed at high cost in one Australian factory. Yet this equipment, because of its size, cannot do a satisfactory job where it is installed, and has unbalanced the comparatively small plant in which it has been set to work, since in the production sequence, the equipment before and after this machine did not "key-in" with this highly specialised unit.

The close connexion between gluten and starch production is a peculiarity of the Australian starch industry. Lack of demand for one commodity is likely to influence the production of the other. Gluten is essentially produced for use as an improver of Australian bread. With better baking practices, the increased use of "starch reduced" bread, and the incorporation of skim milk powder, this demand may suddenly drop and raise a serious problem for the Australian wheat starch industry. In order to meet this situation, it is essential to improve the competitive position of the industry by the introduction of more advanced technical and economical methods, an improvement of standards, and the production of starch derivatives at a competitive price for export.

In order to achieve this objective, it may be necessary to consider the re-siting of some factories, since ample water supplies and good facilities for the disposal of effluents play an important part in the success of any starch industry. This could result in one factory processing a variety of materials, such as maize, arrowroot, and wheat flour. Such a combination could lead to the production of a wide range of starch products both for industrial uses and foodstuffs, and protein meals for stock feed.

The isolated efforts of individual manufacturers to discover the best and most economical way to produce starch are expensive and often frustrated; the author concludes that these problems could more easily be solved by a Central Research Institute which could collect the necessary information and work out the best processing methods for the benefit of the industry as a whole.

Nutritive Value of Gelatin

AMONG the papers presented at the 1954 meat industry research conference held at the University of Chicago in March was one by A. E. Harper and C. A. Elvehjem, of the University of Wisconsin, on the nutritive value of gelatin.

The results of growth experiments and liver fat studies in which gelatin was used as a supplement in low protein diets are discussed. The studies arose from the observation that fat accumulated in the livers of young rats fed 9 per cent. casein-sucrose diets deficient in niacin but otherwise complete. The inclusion of niacin in the diet did not reduce the accumulation of fat, but when 6 per cent. of gelatin was included with niacin, fat deposition was normal. Since gelatin is a relatively pure protein, this effect was evidently due to the amino acids contained in it.

Some interrelationships among the three most limiting amino acids (methionine, tryptophan, and threonine) in the 9 per cent. casein diet have been studied. Fatty infiltration occurred only when the diet was supplemented with methionine. Apparently this infiltration resulted primarily from a partial deficiency.

of threonine which was overcome when gelatin was included in the low casein diet.

It had been reported that the growth of rats fed a mixture of gelatin and amino acids was poorer than that of others fed amino acids alone, and since the action of gelatin reported above depended on its ability to provide amino acids, this point was investigated.

When gelatin replaced an equivalent amount of amino acids in a diet containing crystalline amino acids, the rate of growth of groups of rats fed the two diets was identical.

Dough Retardation

THE early interest in dough retardation as a commercial proposition in the baking industry has not been followed by widespread acceptance of the method. The attitude of the bakery trade is that retardation can become acceptable only if costs can be arranged to allow retail sale of the product at the existing price or less. Also to be taken into account is the fact that no matter how much bakery employees may advocate the abolition of night baking, no practical man can visualise this happening at an economic cost.

A fair number of bakeries are using dough retardation plant to handle their "smalls" production, but the cost of plant to cover the manufacture of bread is so considerable that, short of a revolutionary change in techniques and costs, its general adoption seems unlikely.

It must be stressed, however, that in plants where the system is employed, it works extremely well. Dough is normally made up last thing on the shift, and stored overnight until the start of the early morning shift. In some cases dough is passed directly into the steam press without a time lag or any apparent loss of quality.

Protein Nutrition

THE importance of being able to measure the nutritive value of different proteins or mixtures of proteins is emphasised in a paper in *Crookes Digest*, **23**, 1954, the problem being how to achieve this.

Until quite recently, we were in a fairly happy position when we considered the nutritive value of a protein. As dietary protein is required for the synthesis of body protein, the adequacy or otherwise of a protein for this function was measurable in terms of its amino acid content, as compared with the amino acid requirements of the body. Long, laborious experiments were necessary to determine the biological availability of proteins, but it seemed that analysis of the amino acid make-up of a protein would yield sufficient information to predict the biological value without recourse to these aggravating, expensive, and unreliable biological evaluations.

There are several reasons why the amino acid composition of a protein cannot be expected to predict the biological value.

1. The amino acid content of a protein is not necessarily the same as the mixture available to the metabolic mechanisms of the cell where they are to be used.
2. It is possible, at least under some circumstances, to alter the normal composition of some of the protein synthesised.
3. A cursory inspection of Mitchell and Block's regression curve relating chemical score to biological value suggests that the position and the slope of the line are not what might be expected.
4. Contrary to general expectation, the amino acid content of a protein cannot be measured with any degree of accuracy by the usual standards of clinical analysis.

These real or apparent difficulties are considered in the paper, from which it is clear that further work on the metabolism of proteins in the body is necessary before it can be said whether amino acid composition is the only criterion of the nutritive value of a protein, or whether the other factors mentioned have any practical significance. Until these facts have been ascertained, we are thrown back on the biological method for information about the nutritive value of proteins.

Fortunately, there have been recent improvements in methods, one an abbreviated procedure on rats (FOOD MANUFACTURE, **28**, 8, 297), another a rapid test on protozoa, which make this procedure more usable than the classical methods. Between the two avenues of progress, biological evaluation and further knowledge of the metabolism of proteins, we may yet learn how to predict the nutritive value of our food from a simple chemical analysis.

The Return of the Brands

AT a recent gathering at Sussex House, Mr. J. Price, vice-chairman of Craigmillar and British Creameries, welcoming the return of branded margarine and shortenings, said that delighted as they were at regaining their intimate association with the baking industry in providing one of its major raw materials, he thought that the future must be faced soberly and dispassionately. Freedom of choice in all the baker's raw materials would profit no one unless the advantages of freedom were grasped.

The baker would have freedom of choice not simply between one sort of fat and another, but between manufacturers. This meant that if the baker did not produce what satisfied him as a craftsman he must look to his methods of production rather than blame his raw materials.

Margarines and shortenings were now being produced to manufacturers' own compositions and from raw materials which they specified and whose quality they controlled. Now that the onus for quality rested on the individual manufacturer, good products of consistent quality and performance must be forthcoming. Perhaps one of the biggest difficulties for the baker had been the variation of his raw materials. Regular production to a high standard could not be obtained in such circumstances.

A greater variety of fats, each geared more specifically to a certain range of jobs, should mean a bigger and better variety of baked goods—goods which being consistent in quality and flavour must enhance the baker's business and ward off the menace of home baking.

Many young bakers had never seen anything but the standard cake and pastry margarines and white cooking fat. They had never used, for example, an all-hydrogenated shortening or a high-sugar speciality. They would need to be taught how to use them by the older hands and by responsible manufacturers.

Dealing with competition arising from the derationing of other foodstuffs, Mr. Price went on to say that freedom in quantity of eggs, sugar, and fats must at least divert many housewives back to thoughts of home baking. Could this be overcome? Variety ought to be no real problem. Most bakers were ingenious in developing products that were different and there were so many lines that the housewife could not even begin to make for herself.

Finally, on cost, now that the housewife's materials were no longer so heavily subsidised, the baker could sell a good cake at a price almost the same as she had to pay for the raw materials only, in a variety she could not achieve, and a quality well beyond her capabilities.

Galicia's Fish Canning Industry

PESSIMISM about the present state of the canned fish industry in Galicia and its prospects for the future was expressed by Don Gaspar Masson, writing in the special issue of *Industria Conservera* commemorating the 50th anniversary of the Union of Preserves Manufacturers of Galicia.

The story has been one of recurring crises, with the long-drawn-out latest one leaving the members of the industry at a loss to predict the way out. The almost complete lack of sardines and insufficient landings of albacora (incorrectly named bonito) during a number of seasons have created a desperate situation for both manufacturers and fishermen. Apart from the scarcity of raw materials, there is the fierce competition from the manufacturers of Portugal and French Morocco.

Biologists of world wide repute are at work on investigations, but up to now have found no certain causes for the disappearance or emigration of the fish population from Galician waters. In the meantime, if the scarcity persists, it is recommended that two main measures should be adopted for the protection of the species and the progressive substitution on an industrial scale of others. The first of these concerns restrictions and prohibitions in the taking of sardines and adequate control to ensure compliance on the part of the fishermen. The second measure relates to the reinforcement of the landings of albacora by means of technical improvements in the equipment of existing fishing boats and the handling of live bait in tanks, and the fishing of tunny in African waters by the introduction of refrigerated vessels.

Such means have been found to be effective in those regions of California and Japan in which the sardine has disappeared, and where the catches of tunny fish have reached large proportions.

Food Flashes

THE first half of 1954 has not been lacking in appetising titbits by way of food news items to stimulate a palate dulled by too many dreary subjects. For example, bachelors at breakfast, or perhaps paterfamilias worried by untidy offspring at the table, can take heart at the production of the first terylene tablecloth. The manufacturer proclaimed that he had himself tested the cloth by soaking it overnight in a "brew" of red wine, Worcester sauce, and tomato ketchup; after washing it, he produced the cloth in its original spotless condition.

A second item was Lord Mancroft's plea, made at the annual luncheon of the Hotel and Catering Institute, for a food guide or "Guzzle Book" awarding asterisks (or crossed knives and forks) to good hotels, and black marks to those "serving bath water colder than their drinking water." Lord Mancroft confessed to keeping such a book for 20 years, in which, *inter alia*, he blacklisted publicans who called saloon bars "cocktail lounges."

Next came a report of Sir Robert Perkins in the House of Commons asking the chairman of the Kitchen Committee to arrange to serve maupygernon on May 14, to celebrate the Queen's return. We reached for our encyclopaedias to read of this dish which feudal custom caused to be served on Coronation Day; it turned out to be a "mess in an earthenware pot" either of chicken laced with ginger and cloves, or of hogs' kidneys flavoured with ingredients "suggesting the witch's cauldron in *Macbeth*," as Mr. Steward, the member for Woolwich, put it. He rounded off this whimsical exchange in the Commons by deeming the dish "too risky to try out on members whose attendance is so much sought after by party whips"—a wise decision, since even Charles the Second refused to tackle maupygernon!

To cap the lot came Mr. Speir, M.P. for Hexham, who got up from a sick bed literally to eat his hat—or part of a special hat to redeem a wager. Ever since the "clerical gent" in Pickwick vowed to eat his hat, the threat rather than the action seems to have been the rule. We live in an era of the hatless; hence life becomes duller when fewer politicians can be accused of talking through their hat, fewer comedians sit on one; without a hat how shall we express the mood of the moment? we have wondered. But Mr. Speir has raised our hopes with his five-pound be-ribboned "boater" decorated with marzipan.

Bones are brought by rail from Cardiff Docks to the company's storage warehouse.

Gelatin—From Raw Material to Finished Product

While it is true to say that the greater part of the output of gelatin manufactured in Great Britain is absorbed by the food industry in the manufacture of such products as jelly, marshmallow, mayonnaise, confectionery, and ice cream, it is also used extensively in the pharmaceutical industry in the production of medicinal capsules, in the photographic industry, and, to a lesser degree, in the manufacture of paints, textiles, and paper. The total annual production of gelatin in Great Britain amounts to approximately 10,000 tons, of which about half is produced by the Treforest Chemical Co., Ltd., an associate company of P. Leiner and Sons, Ltd.

SOME 200 years ago in Bohemia the family of Leiner, after experimenting with different manufacturing methods, started making glue from hides. As the business expanded, a branch factory was opened in 1840 in Budapest which eventually became the firm's main factory where the policy was adopted of manufacturing better grades of high glue and of building up a substantial export trade with Great Britain and America.

So successful was the export trade that there arose the need for a London branch to handle the import of glues and gelatin from the Continent; this was eventually opened under the managership of the late Mr. A. Leiner, grandson of the founder and immediate past chairman of the parent and associate company.

In those early days, the manufacture of gelatin in Great Britain was not envisaged by the company, the practice being for the imported gelatin to be flaked, powdered, and blended in a grinding mill established in Bermondsey at the beginning of the century.

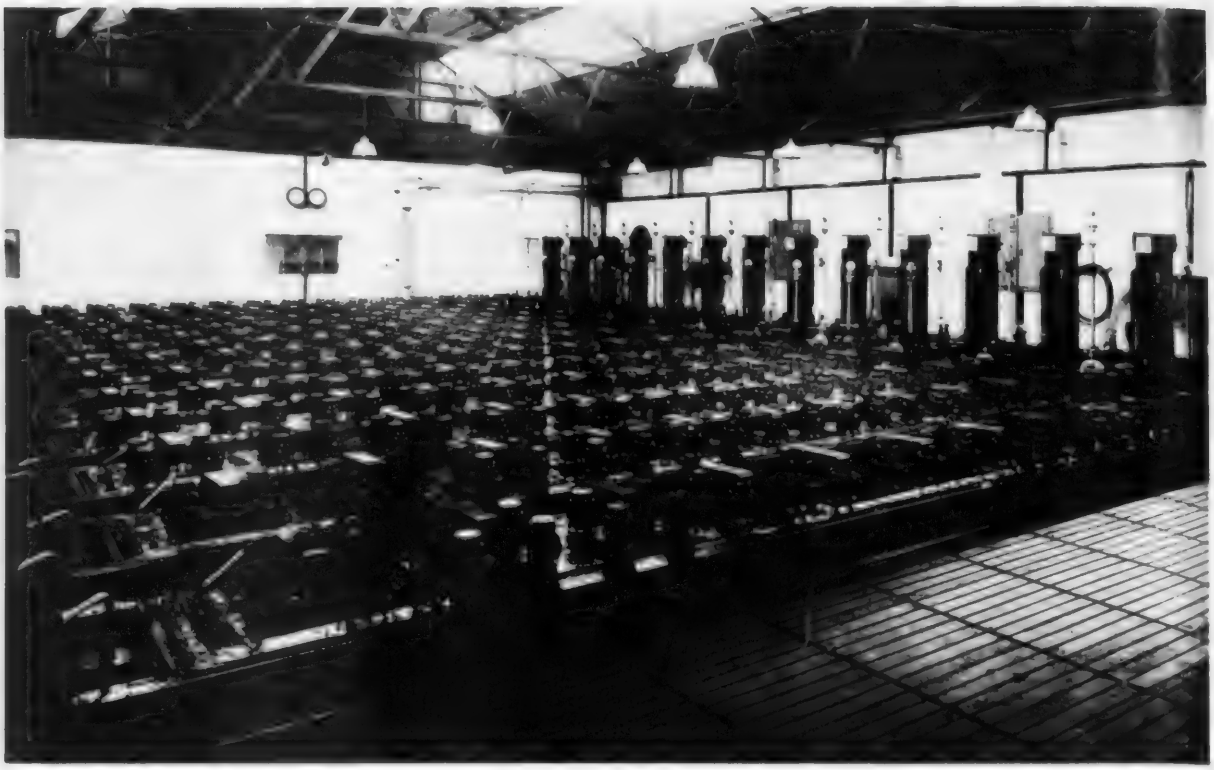
Selection of Treforest Estate

Nineteen years ago, the decision to manufacture gelatin in Great Britain was made, the factory to be erected in one of the distressed areas. There was selected for this purpose the Treforest Trading Estate where abundant labour, electric power, water, and railway facilities were readily available, with Cardiff and Newport Docks within a distance of about 10 miles.

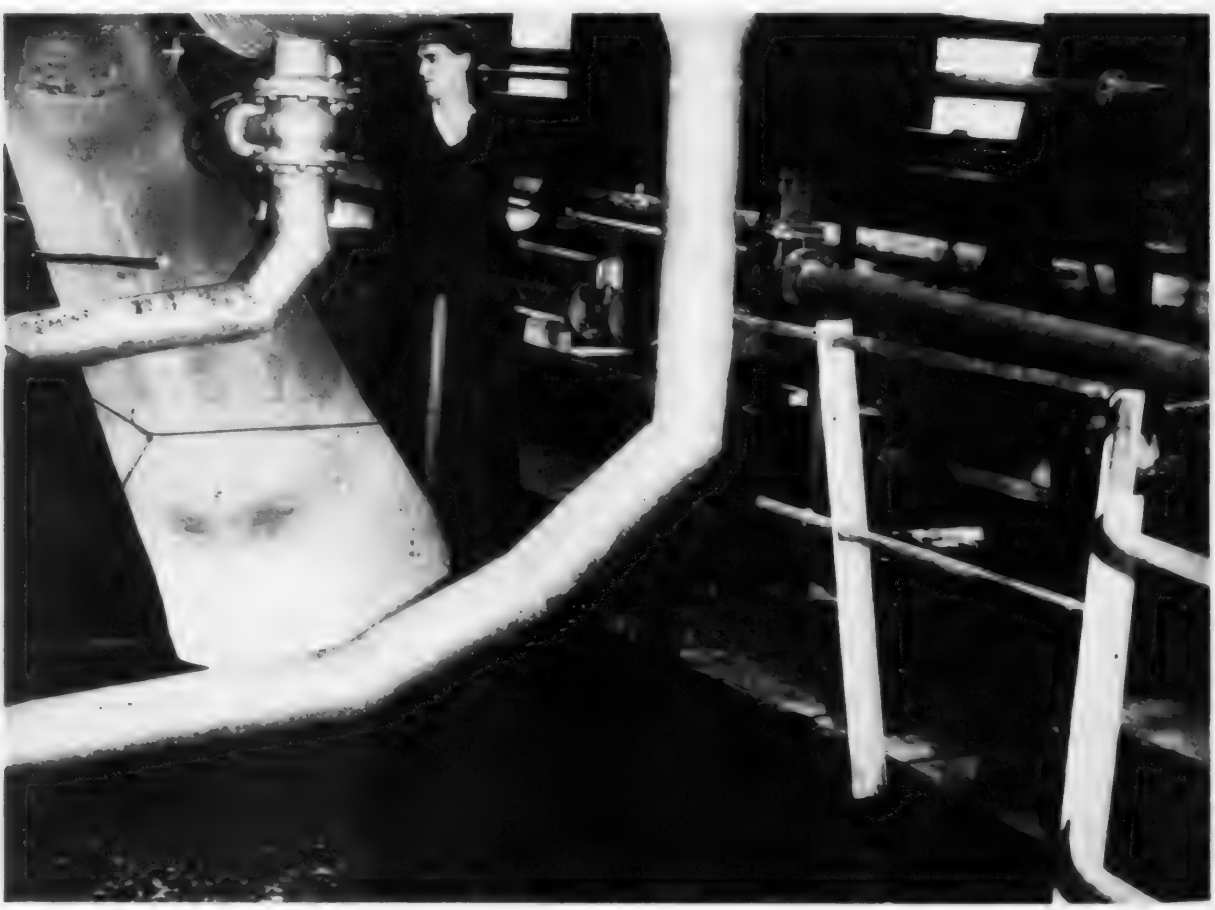
Ossein Gelatin

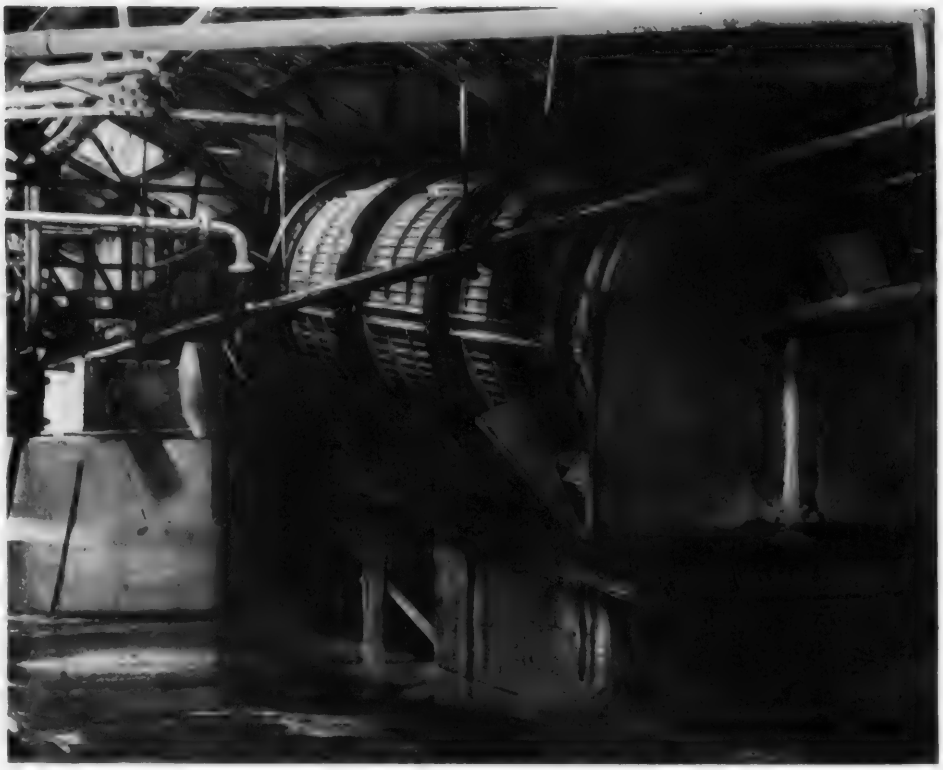
The first delivery of gelatin processed from hides was made from the new factory in February, 1939, although the ultimate object was to produce ossein gelatin. This was first achieved in February, 1943, since when the production of this type of gelatin has rapidly increased, further factory extensions being necessary to keep abreast of the steadily growing rate of output.

The increased use of bone in the



Above: **The de Nora amalgam cells in the electrolytic chlorine plant.** *Below:* **In the acidulation vats, the basic tri-calcium phosphate in the bone is converted into the soluble mono-calcium salt which is run off in solution, later to be converted into di-calcium bone phosphate.**





Right: **After the bones have been treated with hydrochloric acid and washed, the ossein is transferred to liming pits and is then thoroughly washed in the drum washer and in the washing wells shown below. The efficiency of the washing and subsequent treatment with acids has a direct bearing on the ash content of the final gelatin.**

Treforest factory made necessary the maintenance of an adequate and constant supply of crushed bones. To meet these demands, the company established their own crushing mills in various countries, the largest being in India and Pakistan where the sun-dried bones are crushed and graded before despatch to the spacious Treforest bone warehouse.

Hydrochloric Acid Manufacture

In the processing of gelatin, hydrochloric acid is required, six tons of the acid being necessary for the production of one ton of gelatin. To provide its large requirements of acid, the company formed a subsidiary at whose works on the Treforest Trading Estate it is produced.

Two methods are used for the production of hydrochloric acid: the older one involves the use of three Mannheim furnaces in which sulphuric acid is added to potassium chloride to give hydrochloric acid and, as a by-product, sulphate of potash sold as a fertiliser; the other more modern electrolytic process uses the de Nora amalgam cell. This plant consists of three parts—the brine system, the power house, and a battery of de Nora amalgam cells.

The function of the brine system is to dissolve either common salt or potassium chloride in saturators (depending on whether caustic soda or caustic potash is required as a by-product). This solution, duly subjected to purification and filtration, is delivered to the amalgam cells.

The power house consists of 80 selenium cells and 12 transformers for the conversion of 11,000 volts A.C. current to 23,000 amps × 67 volts D.C. current and transmission by large copper bus bars to the amalgam cells.

The de Nora amalgam cell for the production of chlorine, caustic soda, or caustic potash and hydrogen comprises the electrolysis cell and the decomposer. In the electrolytic cells, saturated brine

Above: **The interior of the washing wells, showing the paddles.** *Below:* **After the final washing, the ossein is transferred in a current of water to the stainless steel boiling tanks, from which a solution of gelatin is obtained.**

is electrolysed between graphite anodes and a mercury cathode flowing along the bottom of the cells. Chlorine is liberated at the anode and drawn from the cell to the chlorine cooling and combustion plant. Sodium is liberated at the cathode, forming an amalgam with the mercury. In the decomposer, the amalgam, flowing by gravity from the cell, reacts with water in the presence of a graphite packing to produce caustic soda and hydrogen.

The chlorine and hydrogen are then allowed to react together to produce hydrochloric acid which is absorbed in a normal absorption system.

The decomposer is of the tower type and consists of two stages. In the first of these, the amalgam flowing from the cell is only partly decomposed. In the second stage, located above the first and fed by purified water, the amalgam is totally decomposed with the production of dilute caustic liquor, which is fed back to the first stage.

Great flexibility of operation is possible and highly concentrated caustic liquors can be produced,

strengths varying from 50 to 70 per cent. The product is of high purity and can be used in the rayon industry.

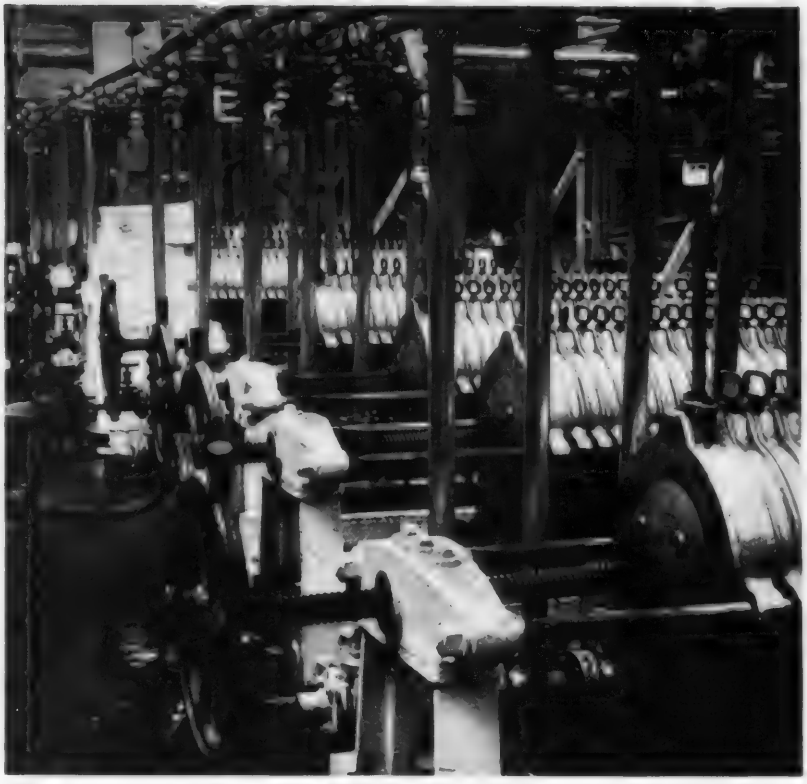
On arrival at the Treforest warehouse—a building of ample proportions—the crushed bones are graded for size and quality and stored prior to processing.

Bone Treatment

The first change in the chemical composition of the graded bone occurs in the acidulation section where, in the battery of rubber-lined tanks, the natural phosphates are extracted by submerging the bone in a dilute solution of hydrochloric acid. During this process, the basic tri-calcium phosphate in the bone is converted into the soluble mono-calcium salt; this is run off in solution for conversion into di-calcium bone phosphate.

In the acidulation tanks, the decalcified bone is carefully washed to ensure the removal of all traces of acid before transferring to the liming section comprising a single storey building housing 200 large concrete tanks. In these pits, the acid-free ossein is mixed with milk of lime. The acidulation and liming process takes three to four months to complete before the next step is taken—the washing of the ossein. This plays an important part in the production of the highest grade gelatin, the efficiency of the operation and subsequent treatment with acids having a direct bearing on the ash content of the final gelatin.

Stringent control of *p*H at this stage ensures the absolute minimum of inorganic constituents in the gelatin.

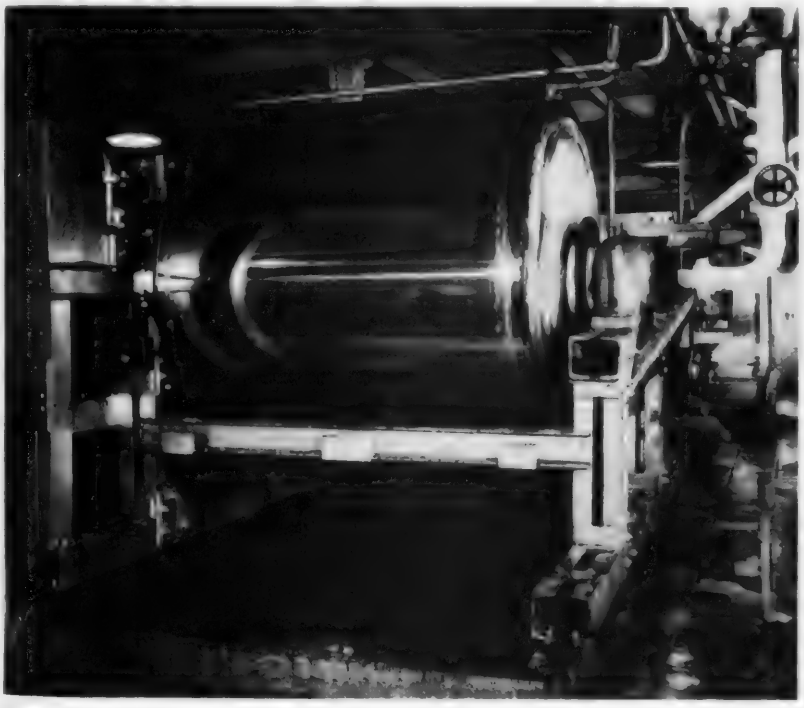


For the removal of all traces of suspended matter, each extraction of gelatin is filtered.

Extraction of Gelatin

At the above-mentioned stage in the processing operations, the ossein attains the optimum conditions for the maximum extraction of gelatin. It is transferred in a current of water to boiling tanks, fitted with perforated false bottoms, hot water is added, and the temperature maintained at 140°F., until the concentration of gelatin is about 5 to 6 per cent. Six such operations are carried out on the ossein to extract the gelatin. The fifth and sixth extractions are classified as a technical gelatin and glue respectively.

For the removal of all traces of suspended matter, each extraction of gelatin is filtered through the battery of presses, the filtering medium being cotton pulp. As soon as the sample taken at this stage passes the clarity test, the solution is transferred to the triple effect climbing film evaporators.



After concentration, the gelatin solution is transferred to revolving cooling drums.

The gelatin is ground and blended before packing for final despatch.

As each batch of liquor leaves the evaporator, the concentrated gelatin is cooled on brine-chilled cooling drums, from which the sheets of gelatin are removed continuously, passed through cutting machines, and dried.

The final operation is that of grinding, blending, and packing, a period of six months elapsing between the time the graded bone is removed from the storage warehouse to the packing of the finished product.

By intensifying or moderating these natural processes in gelatin production, the manufacture of photographic gelatin is also carried out at the Treforest factory, the scale of manufacture being such that quantities varying from one to 20 tons can be supplied.

The main by-product in the manufacture of gelatin, di-calcium bone phosphate, is precipitated from the phosphate liquor by the addition of regulated quantities of lime. The phosphate is ready for packing and despatch after drying. It is widely used as a cattle food and a further grade is also produced which is used as a fertiliser.

Work of the Laboratories

The roles of the bacteriological, analytical, and research laboratories in the manufacture of gelatin are important ones; strict control is exercised throughout all processing operations to ensure that, when destined for the food industry, the gelatin conforms to the legal requirements and, in the case of gelatin used in the manufacture of photographic supplies, that heavy metals are not present.

Physical tests include the measurement of jelly strength, viscosity, colour, solubility, clarity, and foaming properties; chemical tests are for total ash content, constituents of ash, metallic impurities, and *p*H.

The work of the research laboratories is concerned with improvements in manufacturing techniques and with specific requirements in gelatin used for special industrial purposes.

A separate laboratory has been allocated for bacteriological examination where all batches of gelatin are subjected to rigorous tests for the total bacteriological count and for the presence of *B. coli*.

Water Supplies

All water used in the factory—two and a half million gallons per day—is chlorinated, flocculated, and filtered; as a further precaution and to ensure a slight excess of available chlorine and complete sterility, additional treatment with chlorine is given and the water filtered through sand.

The Company's Achievements

The production of high quality gelatin at competitive prices has enabled the company to maintain their export business. Among its latest achievements is the production of a new form of gelatin consisting of miniature sheets, about ¼ in. square, the use of which reduces the soaking period owing to the fact that there are no hard edges, and effects great economies in storage space.

The successful achievements of the Leiner organisation can be attributed in a large measure to the foresight of its late chairman, whose knowledge of the glue and gelatin industry was second to none.

SOME SUPPLIERS OF EQUIPMENT

Selenium cells: *Westinghouse Brake and Signal Co.*
Electrolytic plant: *Oronzio de Nora (Italy).*
Automatic control: *Simplex Electric Co.; Allen West and Co.; Negretti and Zambra.*
Motors: *Brook Motors.*
Filter presses: *S. Briggs and Co.*
Evaporators: *Weigand (Germany).*
Laboratory equipment: *Griffin and Tatlock; Marconi Instruments; A. Gallenkamp and Co.*
Grinder: *Miracle Mills.*
Screener: *Lockers (Engineers).*

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Recent Advances in the Biochemistry of the Proteins

A. E. Bender, B.Sc., Ph.D., F.R.I.C.

The biochemistry of proteins involves a wide field—their biosynthesis and structure, dynamic equilibrium, enzymology, intermediary metabolism of the amino acids, certain aspects of endocrinology, amino acid and vitamin interrelationship, urea metabolism, and a host of clinical and experimental phenomena. The field is advancing rapidly; from some aspects in relatively unimportant stages, from others by great bounds of fundamental importance.

ONE of the more fascinating of the changes wrought by recent work has been in our views of the causation of pellagra. Over 200 years ago, when the disease was first recognised, it was thought to be caused by a toxin. With the newer knowledge of nutrition that so successfully revolutionised so many of our ideas in the 1930's, it seemed to be clearly established that pellagra was a classical vitamin-deficiency disease, the vitamin responsible being nicotinic acid.

The one objection to this theory was that small quantities of milk, containing inadequate amounts of nicotinic acid, were also curative. The objection was explained away on the basis of refection; that milk nourished the intestinal bacteria which synthesised nicotinic acid for the benefit of the host. In 1940, however, Aykroyd and Swaminathan[1] reported findings which were not so easily explained away. They found that there were groups of people in India living on a rice diet containing only 5 mg. of nicotinic acid per day, who rarely developed pellagra; on the other hand, the people in Moldavia, eating a corn diet containing 15 mg. of nicotinic acid per day, frequently developed the disease.

The explanation followed the work of Elvehjem[2] who, in 1945, showed that rats stunted on a diet of corn grits could be cured either with nicotinic acid or tryptophan. Other work[3] showed that tryptophan in the diet gave rise to nicotinic acid in the urine, indicating some relationship. Further evidence[4] suggested that there was a toxic factor present in corn which could cause pellagra. This was so potent that the extracted material incorporated into the diet at the rate of 1 mg. per 100 g. diet produced the symptoms.

The present situation is that either a deficiency of tryptophan or nicotinamide, or the presence of the toxic agent of corn, can be the causative agents of pellagra. The toxic theory of Casals in 1735, so contemptuously discarded when the era of vitamins swept all before it, is again in favour.

Tryptophan to Nicotinic Acid

The route followed in the conversion of tryptophan into nicotinic acid is an excellent example both of the similarity of the metabolic pattern of different organisms and of the methods employed in biochemistry to unravel metabolic mysteries. There is now a fairly clear picture of the conversion of the amino acid into the vitamin, and the dog, the rabbit, bacteria, the mould Neurospora, and man have all been used to provide evidence.

When tryptophan was fed to a dog (Ellinger, 1904)[5] kynurenic acid was isolated from the urine. After subcutaneous administration to the rabbit (Kotake and Iwao, 1931)[6] kynurenine was detected in the urine. When fibrin was fed to rats (Musajo, 1938)[7] xanthurenic acid was found as a meta-

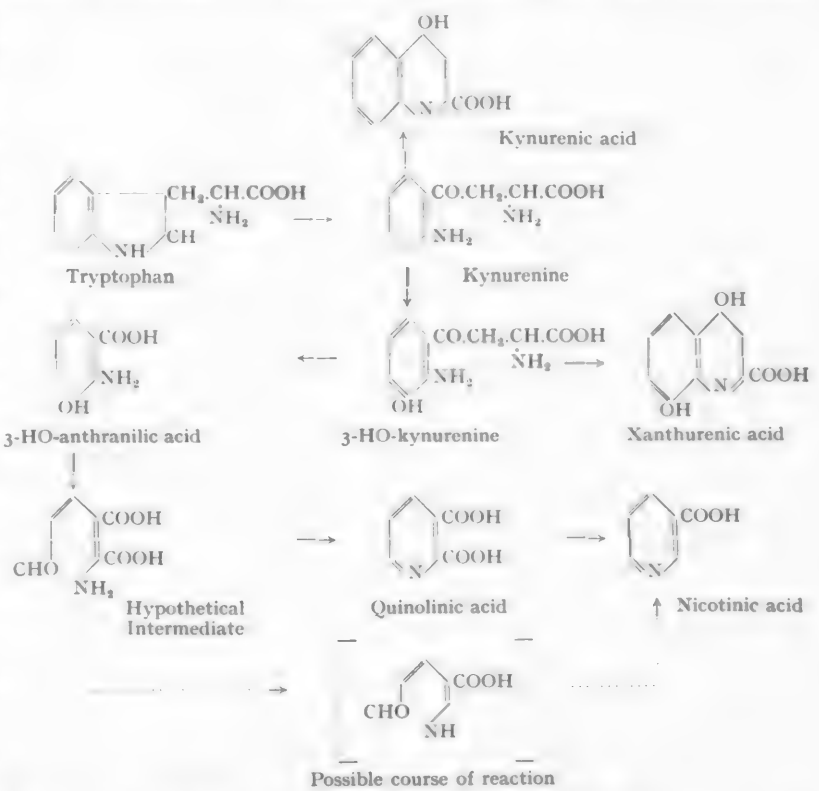

Fig. 1. Postulated route of conversion of tryptophan to nicotinic acid.

bolite, as was also the case in the vitamin B_6-deficient rat. Later Singal, 1946[3], found that the rats fed tryptophan gave rise to a urinary product which hydrolysed to quinolinic acid, which had nicotinic acid activity. Further evidence came from the use of Pseudomonas adapted to use L-tryptophan as a sole source of carbon.[8] This organism was found to be also adapted to kynurenine and kynurenic acid.

Armed with all these pieces of evidence, Mitchell and Nyc[9] used a mutant of the mould Neurospora, which required preformed tryptophan or nicotinic acid for growth, to test the postulated course of interconversion of these two substances. The mutant grew when supplied with kynurenine, an excess of which gave rise to the vitamin, so confirming that kynurenine lay on the metabolic pathway. Kynurenic acid and xanthurenic acids were ineffective, suggesting, as was later confirmed, that these compounds lay on side paths. No other pyridine derivative was of use and it was concluded that the pyridine ring was not formed by the oxidation of quinoline derivatives. The suggestion that 3-hydroxykynurenine was the intermediate was tested by feeding it to the organism, which made use of it. It was oxidised to 3-hydroxy-anthranilic acid, which also promoted growth of the mould, by its final conversion to the vitamin.

The path worked out with Neurospora was verified in animals with the aid of isotopically labelled derivatives and the whole reaction has so far been broken down into the stages shown in Fig. 1. Thus tryptophan is the precursor of the vitamin in animals, moulds, bacteria, and also insects and plants.

Dynamic Equilibrium

One of the most fundamental of the changes that have come over our thinking in the biochemical field in recent years has been the concept of dynamic equilibrium. Earlier views were that the adult body, once it had grown to maturity, was of fixed composition, no further changes occurring apart from repair processes.

In the case of proteins, it was assumed that protein synthesis came to an end when growth ceased. This view was first challenged by Borsook and Keighley in 1935,[10] who suggested that protein synthesis continues even in the adult, but it was the advent of the technique of using isotopically-labelled metabolites that crystallised a new viewpoint on the subject. Schoenheimer and Rittenberg[11] fed to experimental animals amino acids labelled with N 15 and established that the nitrogenous groupings of the tissue proteins are constantly involved in chemical reactions; peptide linkages open, amino acids are liberated, mix with others from the diet and tissues, and re-enter peptide linkages. All these reactions are balanced in some way as yet unknown so that the total amount of material in the tissues and their composition do not change. In other words the body is in a state of dynamic equilibrium.

Metabolic Pool

It is postulated that there is in the body a metabolic pool of amino acids, not contained in any specific organ, but probably spread throughout the tissues. This is the equilibrium with the proteins circulating in the body fluids, the functional and structural cellular constituents, and the so-called dispensable protein stores, that is the fraction which is so readily lost in protein starvation. It is involved in irreversible reactions with the functional cellular proteins, the indispensable protein stores, and the non-protein nitrogen of catabolism. Dietary proteins, in the form of amino acids, enter the pool, which overflows into the excretory pool. The picture is diagrammatically portrayed in Fig. 2.

A system such as this, in a state of equilibrium, has the advantage over a fixed system, that external disturbances are more easily withstood with less change in the system.

Turnover Rate

In a series of classical experiments involving the use of isotopically labelled amino acids, Rittenberg and his collaborators[12] have measured the size of the amino acid pool in man. It is small, amounting to only 0·5 g. of nitrogen per kg. body weight, but the pool is turning over at a very rapid rate. The rate differs in different tissues and is measured by its half-life period. Thus the proteins as a whole have a half-life of 80 days, but this is a mean of rapidly metabolising tissues, such as the liver and the serum proteins, with a half-life of 10 days, and the slowly metabolising carcass proteins with a half-life of 158 days. The rat has a higher turnover rate, the half-life of liver, abdominal viscera, and serum proteins being six to seven days, that of the carcass 21 days, and the proteins as a whole 17 days.

In man, the total synthesis of protein amounts to 1·3 g. per kg. body weight, or 90 g. per day in the average 70 kg. man.

Stability of Connective Tissue

Considerable knowledge has accumulated in the last few years about cellular processes, *e.g.* glycolysis, oxidation, and generation of energy-rich phosphate bonds; the particular site of some of these reactions inside the cell has been found, *e.g.* in the mitochondria. We have little knowledge, however, of the processes involved in extracellular metabolism. All that can be said about vitamin C, for example, is that it plays some part in the metabolism of extracellular tissues.

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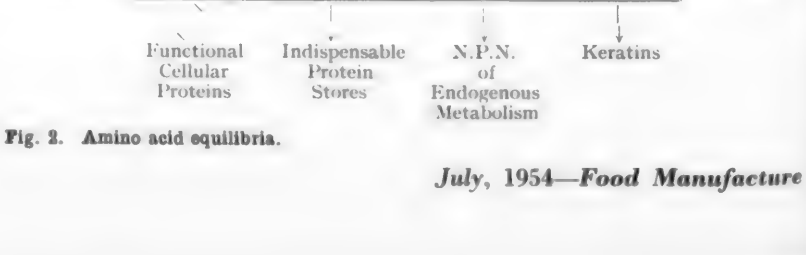

Fig. 2. Amino acid equilibria.

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It may be concluded that once collagen has been synthesised, for which purpose vitamin C is required, it is not degraded and does not need continuous replacement. Apparently, therefore, the dynamic equilibrium has been verified by Perrone and Slack[15] in experiments in which C 14-labelled glycine was fed to rats, and their white tendons, skin, and bone examined for labelled glycine. Little glycine had been incorporated and the activity did not decrease after several weeks, indicating very slow or no degradation of the collagen. In young rats the glycine was actively incorporated, but this was interpreted as growth rather than turnover.

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Earlier speculations[17] attempting to explain this effect included "toxic destruction of protein," suggesting that a toxin liberated by the damaged tissue had a severe catabolic effect. Another theory was that the tissue had an enhanced requirement for certain specific amino acids and "raided the body" for protein, retaining the required amino acids and oxidising the remainder.

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Discoveries in recent years in the endocrine field have shed some light on this problem. It appears that protein catabolism is under the control of the pituitary and adrenal cortical hormones. For example, Noble and Toby[18] were able to cause large urinary losses of nitrogen by treatment with adrenal cortical extract, and by a similar mechanism the great increase in urinary nitrogen which follows trauma did not occur if the rat was previously adrenalectomised.

In 1942, Albright[19] first suggested that this process of protein degradation was related to the alarm reaction of Selye. In 1950, Selye[20] suggested that there was a peripheral synergism between the corticoids and other factors produced by stress. It was later shown[21] that when cortisone is administered to mice, the reaction that follows is twofold. First, there is a rapid mobilisation of readily available protein stores, during which there is a rapid loss of weight and excretion of nitrogen, followed by a period of adaptation. It has also been shown[22] that the response to fracture is quantitatively similar to that produced by the subcutaneous administration of cortisone.

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Apart from the corticosteroids, it is clear that other hormones are involved in protein metabolism and that their interrelationship is complicated. For example, Sirek and Best[23] have recently shown that the protein-anabolic effect of testosterone, the lowering of blood non-protein nitrogen and the reduction in urinary nitrogen that it causes, are produced only in the presence of insulin.

The process of growth is intimately connected with protein synthesis, and is under hormonal control. In man, growth occurs in two stages, prepuberal and puberal. It is suggested[24] that the former is under the influence of the growth hormone of the anterior pituitary, while the puberal growth is controlled by steroid hormones produced by the adrenals and the gonads. In partial support of this suggestion are results obtained by Bartlett,[25] who measured the rate of protein synthesis and the size of the body nitrogen pool in dogs after the administration of various of these hormones by the isotopic method of Sprinson and Rittenberg.[12] Testosterone promoted nitrogen storage by increasing the rate of protein synthesis and decreasing the rate of catabolism of amino acids. There was a decrease in urinary nitrogen but no change in the nitrogen pool. Growth hormone also increased protein synthesis and decreased amino acid catabolism but decreased the nitrogen pool. When both hormones were given together there was no change in the protein synthesised, but a decrease in the amino acid catabolism and a fall in the nitrogen pool.

It is suggested that prepuberal growth, controlled by growth hormone, is accompanied by a high rate of both protein synthesis and degradation, as evidenced by the relatively high demands for protein in the diet and high output of urine nitrogen. Puberal growth is postulated as accompanied by a lower general rate of metabolism, involving a decrease both in the rate of synthesis and degradation.

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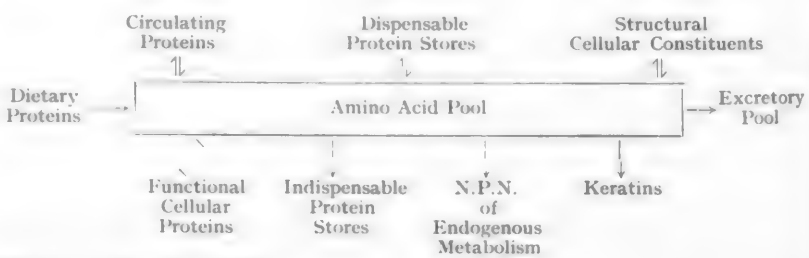

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eight amino acid residues and three equivalents of ammonia; it was shown to be a cyclic disulphide with a M. Wt. of 1,000. Finally the octapeptide was synthesised and found to be fully effective biologically. It produced contractions of the isolated rat uterus and stimulated labour in women. One microgram, intravenously, resulted in milk ejection in 20 to 30 seconds.

Other polypeptides have been synthesised and found to be of value in inhibiting various viruses. For example, a lysine polypeptide reduces the infectivity of tobacco mosaic virus,[27] and inhibits the growth of influenza virus in chick embryo[28] and the multiplication of a bacteriophage.[29]

Azaserine (O - diazoacetyl - L-serine), isolated originally from broth - culture filtrate of streptomyces, has also been synthesised.[30] It has antibiotic activity towards various gram positive and gram negative bacteria, and certain fungi and yeasts. What may prove to be of great promise is that azaserine has anti-tumour activity; it inhibits the growth of Crocker mouse sarcoma but has not yet been shown to be active against human cancer.

Transmethylation

One of the biochemical problems in which such success has been achieved that it would be true to say that it has been largely solved is that of the transfer of methyl groups, the so-called transmethylation.

The importance of biological methylation has been recognised since His in 1887[31] fed pyridine to a dog and recovered methylated pyridine in the urine. The excretion of N-methyl nicotinamide as a metabolite of nicotinic acid, the methylation of carnosine to anserine, and of noradrenaline to adrenaline are other examples of the process.

The concept of the labile methyl group apparently originated in the experiments of Butz and Du Vigneaud[32] (1932), who removed chemically the methyl group from methionine and obtained homocysteine. This compound was then shown [33] to permit growth of rats fed a diet lacking in the essential amino acid methionine, when choline was added to the diet. This led to the suggestion that homocysteine was converted into methionine by the addition of a methyl group, presumably from choline, *i.e.* by transmethylation.

Work on fatty degeneration of the liver, which could be cured either by methionine or by choline, led to the belief that the primary function of the essential amino acid methionine, was to provide labile methyl groups for the synthesis of various metabolites. For example, among the substances that can be synthesised in this way are creatine from glycocyamine. The vitamin choline can also act as a source of labile methyl groups.[33]

Although choline (trimethyl ethanolamine) has three methyl groups, only one is used for methylation. It is first converted to betaine, which supplies a single methyl group, leaving dimethylglycine. An interesting demonstration that betaine is the intermediate *via* which choline carries out its methylation was provided by the use of animals which lack the enzyme choline oxidase, which oxidises choline to betaine. Guinea pigs, animals of this class, were unable to labilise the methyl group of choline but adequately used that of betaine.

Isotopically labelled labile methyl groups can be recovered as labelled carbon dioxide. Thus, in addition to transfer for synthetic purposes, the methyl group is oxidised. It appears that this degradation takes place through formate. At the same time the process is reversible and methyl groups can actually be synthesised from formate (but not from carbon dioxide). In fact, quite a collection of one carbon compounds have been shown to be possible precursors of methyl, including formate, formaldehyde, and methanol. Glycine, acetone, and serine similarly, as sources of formate, are precursors of methyl.

Biosynthesis of the Methyl Group

The basic evidence for the transfer of the methyl group of choline to homocysteine was secured by Du Vigneaud and his coworkers when he showed that rats were unable to grow on a diet containing homocysteine but lacking labile methyl groups. It was noticed, however, that occasionally some animals, after losing weight on this diet, started to grow again while still on the same diet. It seemed that methyl groups were being synthesised by these animals and, as usual, the intestinal bacteria were held responsible. Experiments using rats entirely free from bacteria, however, the strain of the University of Notre Dame, showed that choline can be synthesised in the tissues.[34]

This synthesis normally occurs at a rate inadequate for the needs of the animal, but in those animals which, on deficient diets, recommenced growth the amount synthesised must have been adequate.

Involvement of Vitamin B_{12}

Du Vigneaud's rats, as mentioned previously, occasionally showed the ability to grow in the absence of methionine and choline. In contrast, however, Toennies and Medes[35] found that the majority of their rats would grow on this deficient diet. Exchange of animals between these two groups of workers led to the suggestion that the pre-experimental diet was a major factor controlling differences between the groups.

To test the suggestion that the diet was stimulating the growth of intestinal micro-organisms, which in turn synthesised the methyl compounds, sulphasuxidine was fed together with homocysteine. Growth stopped and was not restarted by the addition of folic acid or biotin, whereas choline or liver extract permitted growth by adequate use of the homocysteine. The factor responsible was shown to be vitamin B_{12}.[36] It became clear that folic acid and B_{12} were involved in the biosynthesis of the methyl groups. Storage of these in the liver explained how some colonies were able to grow in the absence of methyl groups.

The choline content of the various diets used in these experiments ranged from 0·2 to 0·6 g. per 100 g. of diet, the B_{12} equivalent of these quantities of chlorine was 1 to 3 micrograms per 100 g. of diet, *i.e.* of the order of 1 100,000 of the equivalent amount of choline. This indicates an enzymic function for the vitamin.

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The Composition of Food

A BOOK* of interest and practical value to nutritionists contains tables showing figures for vitamin A, ascorbic acid (vitamin C), thiamine (vitamin B_1), riboflavin, and niacin content of foods commonly used throughout the world and for two minerals, calcium and iron.

The two main groups of tables in the book relate to food composition in terms of the retail weight (as purchased) and to composition of the edible portion and the percentage of refuse in the material as purchased.

The values given in the tables for minerals and vitamins are based on total content. No attempt has been made to assess the quantity available to the body. Calcium and iron values are expressed as milligrams of these elements per 100 g. of food. Vitamin A is expressed in international units and the B vitamins and ascorbic acid in terms of milligrams per 100 g. of food. Figures showing the calorie value (in number per 100) and the protein and fat content (as percentages) are also included. These were first published by FAO in 1949, but have been included in the present tables for the convenience of those using the tables.

The figures given in the tables are for uncooked foods, either raw or with the form of processing indicated. They are designed for use in many parts of the world, and the author says it would have been impracticable to include in them data showing the composition of foods as eaten because of the wide range of preparation and cooking methods followed in different regions. Tables showing the nutrient values of foods after preparation for consumption are usually valid only within a restricted area in which methods of preparation and cooking are relatively uniform.

The foods which received special attention in the preparation of the tables were the major cereals, starchy roots and pulses, and the most widely used foods of animal origin, such as cheese, meat, milk, insects, fish, and shellfish.

In an introduction to the book, Dr. W. R. Ackroyd, the Director of the Nutrition Division of FAO., points out that some interesting and important conclusions have emerged from the author's world-wide study of the subject. It has often been maintained, for example, that the nutrient content of foods varies widely from place to place, but Miss Chatfield has found that similarities have been more conspicuous than discrepancies in the values reported for a food when a sufficiently large number of observations under varying conditions have been available from several countries. This, says Dr. Ackroyd, tends to confirm the value of international tables.

It is the intention to revise the tables from time to time and to add data for other foods. For this reason, the Nutrition Division of FAO would welcome reports from scientific workers concerned with food composition which will help in the task of revision and extension. In particular, information is required on refuse in food. Data on the percentage of inedible material and of portions not generally eaten are needed for making valid estimates of the quantities of nutrients in foods at the retail level as purchased.

* *Food Composition Tables—Minerals and Vitamins.* Pp. 117+v. H.M.S.O. Price 5s.

Correspondence

To the Editor,

FOOD MANUFACTURE

Margarine

DEAR SIR,—In your issue of June, 1954, page 216, you refer *inter alia* to the pronunciation of the word "margarine." May I remind you of a compromise that I suggested many years ago, though so far it has not been put into use? Possibly this is due to absence of the necessary publicity which I am hoping your columns may afford. It is simply that the "g" should be hard in the winter and soft in the summer.

Yours faithfully,

A. L. BACHARACH.

London.

Making Known

MR. LEONARD HILL'S ADDRESS TO THE AGRICULTURE GROUP

THAT there should be a much greater interchange of technical information between firms and industries was one of the points made by Mr. Leonard Hill, chairman of the Agriculture Group of the Society of Chemical Industry, when he addressed members at the annual general meeting of the Group. It was difficult to understand the short-sighted policy of secrecy adopted by so many British industries. Reference to the American policy on "trade secrets" confirms that a freer exchange of information could harm no one, and its dissemination would benefit both industry and the nation.

The modernisation of factory and plant layout, bulk handling techniques, and effluent treatment and disposal were examples of such information, the dissemination of which could be achieved by means of short research communications which would speedily bring before the public the latest developments in the technological field.

Publishers of technical journals and books were interested primarily in the technological and "know-how" type of information. The frequent complaint of scientists concerned the difficulty of getting their papers published within a reasonable time. Mr. Hill suggested that scientists might usefully turn to the technical Press for help; the idea that they might lose status unless their work were published exclusively in the Proceedings or Transactions in the Journals of their particular Societies was an outmoded one. The use of the technical Press would ensure speedy publication and a wide and influential readership.

Touching briefly on the financial aspects of publishing, Mr. Hill said that there was considerable misunderstanding of the true state of affairs. The services supplied by the publisher were numerous and costly. The question of the author's remuneration was one which arose in this connexion. If he complained of the small return, the regrettable reason was the reluctance of many people to pay higher prices for books. It was the publisher who took the financial risk in the matter. Some valuable facts about copyright and subsidiary rights relating to the author's material were also given by Mr. Hill.

Another important and interesting angle discussed was the preparation and presentation of manuscripts. The author could not expect the publisher, the reader, or the compositor to edit, check references, correct errors, in fact practically rewrite the book. Mr. Hill's advice was that authors should send MSS with all the corrections already made. Galley proofs were not sent to him that he might see "how it looks in print," but to ensure that the compositor had set correctly what was sent to him. It was to avoid the high expense of corrections at the galley proof stage that a percentage of their cost was charged by the publishers against the author's royalties. Some instructive slides showing part of the technique of a printing works emphasised some of the points made.

In the final part of his address, Mr. Hill made some mordant observations on the subject of reviewers and reviews, their requirements, and the snags and their avoidance.

How to Make Bread

WITH the continuing rapid advance of applied science, one of the most necessary and difficult tasks today is the bridging of the widening gap between those who are employed in discovering and developing and those who are engaged in teaching and learning. Anyone who has tried to write a text-book and who has been overwhelmed in the attempt by the pace of technological progress, as much as by the pressure of other work, can only view with appreciation the more successful efforts of others.

Mr. E. B. Bennion's wide experience of industry and teaching makes him peculiarly fitted to write a book primarily intended for the use of candidates for the examinations of the City and Guilds of London Institute and others. This new edition of his well-known book* will continue to be useful to such candidates and many others in the baking industry.

In some respects, the bridge he has built between industrial and scientific development, the bakery, and the classroom is a comparatively slender one, but that is because he has had to cover so much ground to achieve his object. Such varied chapter headings as "Bakery Organisation and Costings," "Acidity and Hydrogen Ion Concentration," "Humidity Control and Ventilation," and "Staleness in Bread," to name only a few, show the magnitude of the task the author has set himself.

A fair sized volume has already been written on only one of the bread improvers with which Mr. Bennion deals in a dozen pages. Another volume of equal size could be written on the subject of "Test Baking," about which Mr. Bennion knows far more than he can hope to compress into the two pages devoted to this problem.

The chapter dealing with mechanical methods of dough testing has been brought up to date, but its value to the student would be enhanced by a critical comparative survey of the information provided by the instruments described, each of which has its own peculiarities, advantages, and defects. At the end of his chapter on staleness in bread, the author refers briefly and dogmatically to the legality or otherwise of the use of various bread softeners and his oversimplification of the position both in the U.S.A. and in Great Britain could be misleading.

Mr. Bennion will be able to place the bakery student and the bakery technologist still further in his debt in future editions of his valuable text-book by decreasing the number of pictures and increasing the number of working diagrams.—S. W. B.

* *Breadmaking: Its Principles and Practice*. By Edmund B. Bennion, M.Sc. (Tech.)(Vict.), F.R.I.C. 3rd Edition. Pp. 411+xii. Geoffrey Cumberlege, Oxford University Press. Price 42s. net.

A Milk Substitute from Groundnuts

V. Subrahmanyan, M. N. Moorjani, and D. S. Bhatia

Division of Food Processing,
Central Food Technological Research Institute, Mysore.

The milk substitute prepared from soya bean (*Glycinehispida L*) has been extensively used as a substitute for animal milk by the Chinese since its discovery by Wahi Nain Tzelang. Soya bean, however, is not widely grown in India, its place being occupied by the widely grown groundnut. Investigations into the possibility of processing groundnut, the annual production of which amounts to about 3·5 million tons, for the production of milk were therefore undertaken.

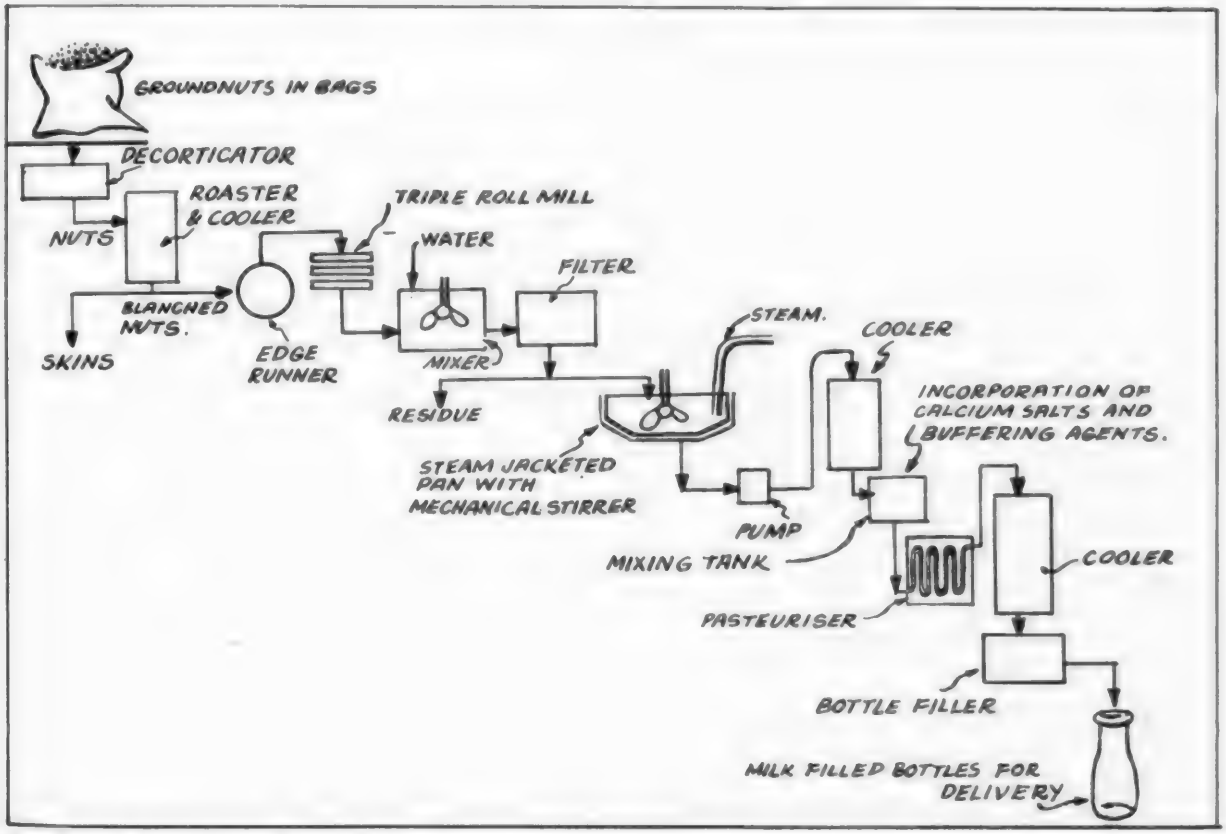
THE *per capita* consumption of milk in India is only 5·4 oz. per day.[1] Owing to the increasing pressure of human population on land, adequate supplies of fodder crops and concentrated feeds are not available for animals. Animal feed is therefore the limiting factor in increasing milk production.

A reference to literature indicates that Dr. Carver,[2] an eminent negro scientist, did some work on groundnut milk, but no detailed investigation was carried out to develop a technique for the production of milk on a commercial scale. The earlier work on groundnut milk by Desikachar, De, and Subrahmanyan[3] revealed a number of drawbacks, among which were its characteristic nutty flavour, its instability, and its low nutritive value. Work was therefore undertaken with the object of overcoming the above defects in order to produce a nutritious and a palatable product. This work has been successfully concluded and it has now been possible to produce a groundnut milk having a good keeping quality and from which the nutty odour has practically been removed. The milk has also been fortified with minerals and vitamins so as to raise its nutritive value to the same level as cow's milk.*

Raw Materials

The groundnuts used in this investigation were of the trade types grown in India, *viz.* Coromandel, Bombay Bold, Red Natal, and Khandesh, all of which were found to be suitable. Coromandel variety has been used for the semi-large scale production as it

* The process has been covered by Indian Patent No. 47902 (1952) C.S.I.R. (India).



Flow diagram of groundnut milk processing.

The groundnuts are decorticated in a hand or power driven unit fitted with a blower which effectively separates the kernels and shell.

is available locally throughout the year. Khandesh ranks highest and Bombay Bold lowest in respect of oil content of kernels, the former ranging from 50 to 55 per cent. and the latter from 49 to 50 per cent.

Decortication and Blanching

The groundnuts are decorticated in a hand or power driven unit fitted with a blower, which effectively separates the kernels and shell. The yield of kernels from different varieties is given in Table 1.

Various methods shown in Table 2 were tried for the removal of the cuticle from groundnut kernels.

Mild roasting (No. 4 in Table 2) of the groundnuts was found to be the best method, as it takes much less time than the others. Cuticle is detached to the extent of 98 per cent.

The roasted groundnuts are cooled in a current of air and the cuticle and germs detached by mechanical rubbing. Damaged, shrivelled, and unblanched seeds are removed manually.

Grinding of Kernels into a Paste

A variety of machines could be used for the grinding operation. Either a combination of edge runner and a triple granite roller mill or a roller mill alone for small quantities has been found suitable. When large quantities are to be handled, a Kek mill could also be used to advantage.

The paste is mechanically stirred with water five to six times the original weight of the kernels, and then filtered through mull cloth or filter press.

The emulsion which thus filters out is treated with saturated lime water to adjust the reaction to *p*H 6·8. About 95 to 98 per cent. of the dry matter of the kernels is transformed into emulsion.

Deodorisation and Cooling

The emulsion is brought to a boil, care being taken to see that the *p*H of the milk is maintained at 6·8; if necessary, extra lime water is added. To remove the characteristic nutty flavour, live steam is then bubbled through the milk for 30 to 60 minutes, depending upon the quantity of milk and the quality of groundnut kernel.

The deodorised milk is immediately passed through coolers to bring its temperature to about 104°F. for utilisation as "curd" (Yoghurt-like product) or to 50°F. for storage as fluid milk.

TABLE 1

YIELD OF KERNELS FROM SOME VARIETIES OF GROUNDNUT

Indian name of the variety	*Origin of seed*	*Nature of kernel*	*Proportion of kernels to pods—% by weight*
Coromandel Talquale ..	Mozambique-Mauritius	Oval seeds, light red in colour	70
Bombay Bold	Large Japan	Large seeds of oval shape, light red colour	68
Khandesh	Spanish peanut	Round small seeds, pinkish colour	72
Red Natal	Small Japan	Round small seeds, deep blood colour	74

TABLE 2

REMOVAL OF CUTICLE FROM GROUNDNUT KERNELS

Method of removing cuticle	*Colour of milk*	*Observations*
1. Pominiski's[4] method. Soaking kernels in water, drying, and then rubbing off the cuticle	Slightly dull	Easy to remove cuticle but the entire procedure takes a long time.
2. Soaking in hot water for a few minutes	Attractive white colour	Time consuming method. Only about 70 per cent. of groundnut can be converted into milk.
3. Lye treatment [depigmentation of cuticle with a view to using the kernel along with cuticle (Burnett[5, 6]]	Dull	From some of the varieties of groundnut it was difficult to remove all the colouring matter; it takes too much time.
4. Roasting at 120°C. for 5-10 minutes in an open pan roaster	Slightly dull	Easy method.

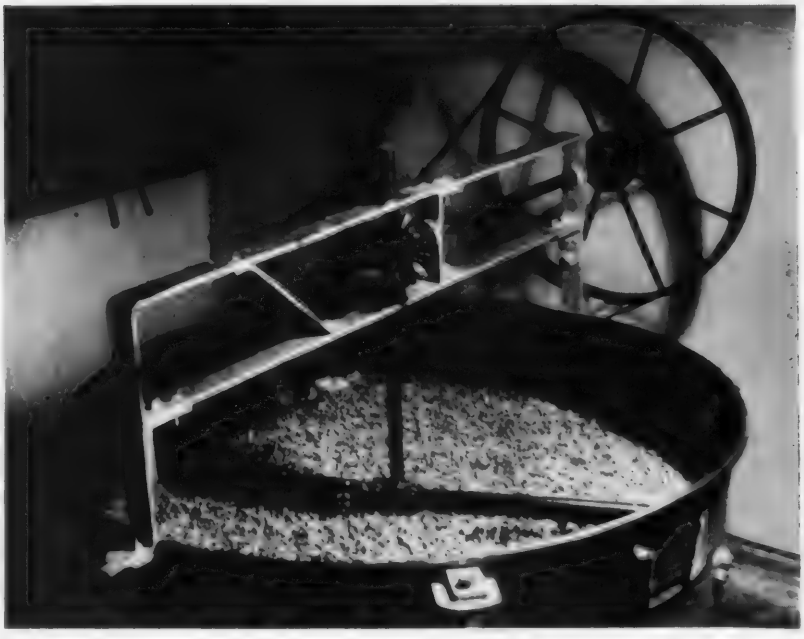
Stabilisation and Fortification

The milk is adequately fortified and buffered with minerals to raise its calcium content to about 110 mg./100 ml., and to stabilise the emulsion. It is then fortified with vitamins A, D, B_2, and C.

Extra water is added so as to obtain 8 lb. of milk for every pound of kernels processed, after which the milk is passed through an homogeniser or a colloid mill to break up the fat globules uniformly and at the same time to disperse the added salts as colloids.

Chemical Composition

The average composition of the milk prepared on a semi-commercial scale is given in Table 3.



The groundnuts are roasted in an open pan roaster.

TABLE 3

COMPARATIVE COMPOSITION OF GROUNDNUT MILK AND COW'S MILK

	Groundnut milk per cent.	*Cow's milk per cent.*
Protein	3·00	3·30
Fat	5·20	3·75
Carbohydrates	3·07	4·85
Ash	0·80	0·72
Total solids	12·07	12·62

Vitamin content per litre of milk:

	Groundnut milk	*Cow's milk*
Thiamine	0·65 mg.	0·45 mg.
Riboflavin	2·00 mg.	1·70 mg.
Nicotinic acid	11·10 mg.	1·26 mg.
Ascorbic acid	17·7 mg.	15·9 mg.
Vitamin A	1,400 I.U.	1,320 I.U.
Vitamin D	200 I.U.	20 I.U.

The paste is prepared in a roller mill, after which it is mechanically stirred with water and filtered.

Groundnut is a good source of some other vitamins, one litre of milk having the following calculated amounts:

	mg.
Pantothenic acid	3·1
Pyridoxin	0·38
Inositol	225·0
Folic acid	0·35

Overall Nutritive Value

Metabolic studies with albino rats by Moorjani and Subramanian[7] showed that the calcium of the fortified milk is well utilised. The calcium fortified milk has a good supplementary effect on the rice diet as shown by the data in Table 4.

TABLE 4

SUPPLEMENTARY VALUE OF GROUNDNUT MILK

	Average weekly growth of rats g.
Basal diet	2·3
Basal diet + 10 ml. of calcium fortified groundnut milk	9·7
Basal diet + 10 ml. of cow's milk*	11·9

* Reconstituted milk from whole milk powder was used as the control product as it is more dependable for its uniformity in composition than cow's milk ordinarily obtained in the market.

The milk is deodorised in a steam jacketed pan.

made to superimpose synthetic flavours over the original flavour of milk by using various combinations in different quantities of diacetyl, butyric acid, vanilla, cardamon, and monosodium glutamate. These added flavours improve upon the original flavour but do not make it as acceptable as cow or buffalo milk.

Further experiments are in progress to effect more efficient deodorisation of milk and to introduce flavour similar to that of cow or buffalo milk. A flash deodoriser working on the steam injection principle has recently been set up at the Institute.[9]

The milk can be kept at ordinary room temperature (26° to 30°C.) for about 16 hours without any adverse effect on the flavour. If refrigerated, the milk keeps for three to four days.

Economics of Production

Based on the pilot plant set up at the Institute, it is estimated that a plant for the production of 1,000 lb. of milk in eight hours calls for a capital investment of about Rs.60,000. The ex-factory cost

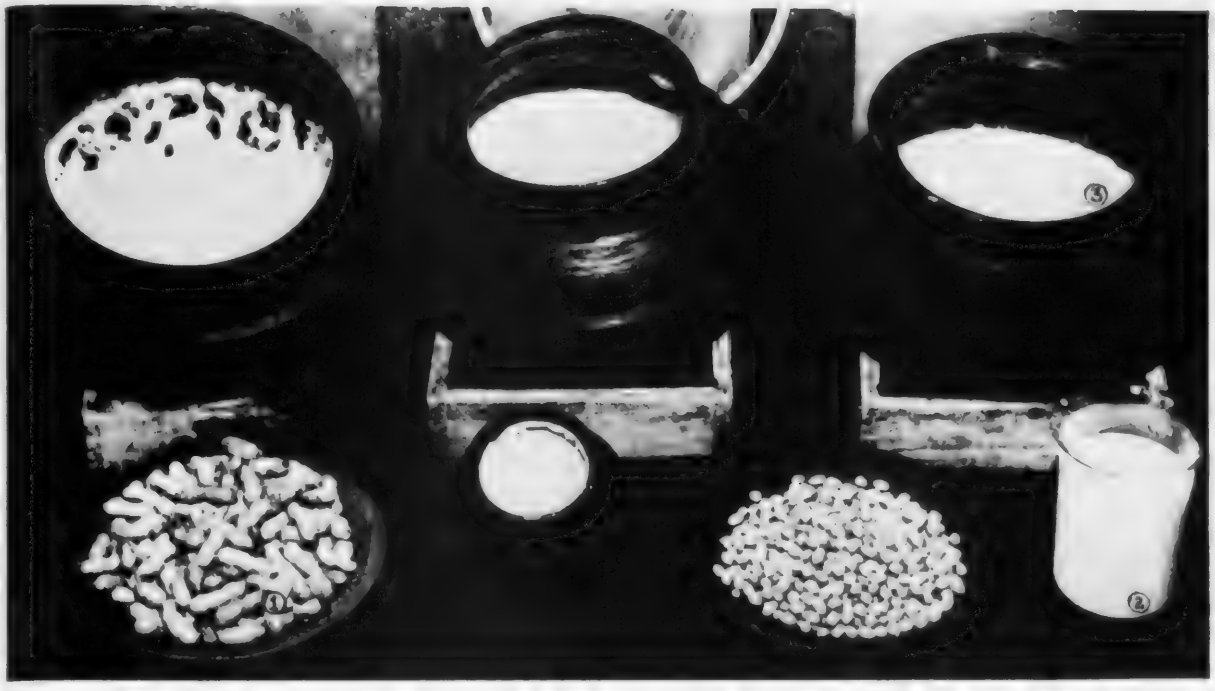
Groundnut protein is inferior to casein as shown by Desikachar, De, and Subrahmanyan[3]; when supplemented with vegetable protein like soybean, it compares fairly well with casein.[8] Attempts are being made to enhance the protein quality of milk by admixing with groundnut some other easily available vegetable proteins, due regard being given to the colour, flavour, and keeping quality of milk.

Flavour of Milk

When adequately deodorised the milk is devoid of groundnut flavour but has its own characteristic flavour which is not akin to that of animal milk. When the milk is subjected to lactic acid fermentation and converted into curds, its characteristic flavour is masked by a strong and pleasant fermentation aroma. The flavour of the milk is pronounced when used with tea or coffee.

In order that the vegetable milk may be used as fluid milk at par with cow or buffalo milk, it is imperative that the flavour be modified. Various attempts were

Extra water is added so as to obtain 8 lb. of milk for every pound of kernels processed, after which the milk is passed through an homogeniser or a colloid mill to break up the fat globules uniformly and disperse the added salts as colloids.



The production of milk from groundnuts has been found to be an economically feasible proposition and to have a wide variety of uses. In the illustration are depicted groundnuts (1), milk (2), and curds (3).

of production is estimated at Rs.0-2-1 per pound of milk. It may be stated here that cow or buffalo milk is available in different parts of India at a price varying from Rs.0-5-0 to Rs.0-8-0 per pound. It is thus seen that the production of milk from groundnuts is an economically feasible proposition.

Varied Uses of Groundnut Milk

Curd and buttermilk.—Extensive consumer acceptance trials over a period of three years have confirmed that vegetable curd and buttermilk are acceptable. Unlike cow or buffalo milk, the vegetable product does not contain any lactose and it is necessary to add 0·5 to 1 per cent. invert sugar for the development of lactic acid by micro-organisms during fermentation of milk into curds. The fermentation can be brought about by adding to the milk 1 per cent. of preformed groundnut or cow's milk curd. Groundnut milk gives a thickly set curd of attractive white colour and good texture.

Salad cream.—Cream of fat content ranging from 20 to 40 per cent. can be separated from the milk by ordinary cream separator. When flavoured with very small quantity of diacetyl, groundnut milk cream can hardly be distinguished from cow or buffalo milk cream.

Miscellaneous products. — The milk can be used for making milk shakes and ice cream. Cottage cheese can be made by using vegetable rennet (fig latex).

ACKNOWLEDGMENT. — The authors wish to acknowledge the help rendered by Messrs. B. H. Krishna, Y. K. Raghunatha Rao, and S. K. Lakshminarayana of the Division of Food Engineering of the Institute in being responsible for the maintenance of the pilot plant.

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The Leonard Hill Technical Group

Articles published in some of our associate journals in the Leonard Hill Technical Group this month include:

World Crops.— Mechanical Handling, Part II; Natural Factors and their Influences on Tea Production; Trials with Systemic Insecticides on Hops; The Cocoa Industry in Nigeria, the British Cameroons, and French Cameroons, Part I.

Atomics. — The Determination of the Energy of Proton Gamma Resonances and their Use to Check Theories of Nuclear Structure, Part II.

Building Materials Digest. — Architectural Bronzes; Timber Identification; Glass in Building, Part I.

Chemical & Process Engineering. — Seaweed Processing Research.

Corrosion Technology.—Corrosion Inhibitors.

Petroleum.—Bulk Oil Storage; Trends in Modern Viscometry, Part II; Oil in South Africa; Petroleum Additives, Part II.

Paint Manufacture. — The Chemistry of the Metallic Soaps; The Application of Soaps in the Paint Industry; Carbon Blacks for Protective Coatings; Conophor Oil.

Feeding the People

THE author of a recent work* is described as a "professor, poet, and specialist in those aspects of scientific research that promote human welfare." This may be a useful combination of qualities for a book which sets out to explain in popular terms what is being done, and what we may confidently expect to do, in opening up new areas to cultivation and in increasing yields of food.

The plan of the book is a simple one. The first part deals with the land, treating in successive chapters with the problem of forcing back the deserts, northern temperate farming, tropical agriculture, the areas deficient in plant nutrients and trace elements, and the possibility of harvesting the seas. In the second part, the author discusses the control of water resources, the prevention of wind erosion, the "battle against disease," the circumvention of waste, and the introduction of new crop plants.

Some would argue that there are more specialisations here than one man could safely handle. It is true that the author's judgment is not equally trustworthy throughout, but that is not the point. The point is that he has managed to embody in his writing the attitude of all sensible agricultural scientists who do not claim that the desert will be made to blossom like the rose, but says simply: "Let's have a try at it and see what will happen."

The book recounts some of the attempts that are already being made and, by inference, suggests many more that could be made if we had the men and the resources.

If there is a weakness in the work, it is that the author takes perhaps too little account of the human factor. This is the more curious, in that he would seem to be well equipped for assessing its significance. But, after all, that was not his immediate purpose. Attention is drawn to it, because this seems to be a failing in many studies of the kind.

Farming has to be carried on by millions of peasant cultivators; before a new method can be effectively applied, their co-operation has to be gained and, if necessary, the whole social and economic structure of their lives has to be changed. They are still for the most part imprisoned within the walls of their own traditions and their own economic set-up. The real problem is not whether it can be done, but how long it will take. The natural conservatism of the peasant is due mainly to the fact that his methods of cultivation have for generations yielded crops of a kind. Often in his memories there survive tales of a disaster arising from some ill-considered experiment. He has to be convinced that a change in methods is worth while, and the scientist has to be convinced that the methods he is proposing are suited to the soils and climatic conditions of the area. One failure, like that of the poultry raising venture in West Africa, can delay progress for 20 years; it is a mistake to suppose that the African does not notice these things.

With all that has been written (and no doubt will be written) around the subject of increasing human populations, it should be possible to take a balanced view. There are signs in some of the newer nations of the world that, while their numbers are rapidly rising, their birth rate is just beginning to slacken off. Judging by past experience in Europe, it will be at least a generation or two before these first faint signs develop into an unmistakable demographic trend.

Meanwhile the populations will rise, and by the time a declining birth rate in combination with a fairly static average expectation of life have begun to carry the populations towards a certain stability, our global numbers will probably have grown from just over two thousand million to more than ten thousand million. There is no reason to suppose that they will not by that time be able to make a tolerably good effort at feeding and clothing themselves. The problem is how long it will take in one country or another to transform farming practices and farming organisation. If it takes a long time, then at our present rate of population increase there are going to be in some parts of the world some very tight and perhaps catastrophic situations ahead.

Men will live through these situations, though rather painfully, and will learn something from them, including some ideas about controlling their own fecundity. But the fact must be faced that most of the modern world seems bent upon delaying the necessary farming reforms as long as possible. As the world food problem becomes a little more acute, the heavily importing countries like our own, Belgium, and Italy, may be among the first to suffer. Whatever they risk otherwise, the prime duty of these countries should surely be to look to their larders.—F. Le G. C.

* *Let There be Bread.* By Robert Brittain. Pp. 263+xi. Spalding and Levy. Price 12s. 6d.

Fuel Economy

PRACTICALLY all branches of the food manufacturing industry require process steam, and in these days when the call is for maximum efficiency in fuel consumption, the combined power and process steam plant can achieve great economies. Nevertheless, there are certain conditions which must be met if such a scheme is to operate successfully; these are concerned with the selection of prime movers, thermal storage, and types of steam engines, turbines, and boilers.

Engineers and those responsible for the installation and maintenance of such plant will find this subject has been tackled in a workmanlike manner in a recent book* which deals with the principles, both thermodynamic and economic, of power and process steam plant, and describes in detail the turbines, engines, boilers, and other plant which may be used under various conditions, with full maintenance and operating instructions.

* *Power and Process Steam Plant.* Edited by E. Molloy. Pp. 184+vii. Newnes. Price 17s. 6d.

Progress with Quaternary Ammonium Compounds

J. C. L. Resuggan, F.R.I.C.
Director and Chief Chemist, The British Hydrological Corporation.

In previous articles has been discussed progress in the use of the cold chemical sterilising agents of the surface-active quaternary ammonium class (FOOD MANUFACTURE, 22, 11, 485 **and 25,** 11, 462**) Since the publication of the last article, progress in this field has been well maintained, and although their use has extended into the medicinal and veterinary fields, their main application is in the food and catering industries.**

TWO of the principal outlets for the use of quaternaries are the brewing and beverage industries, the cold sterilisation of plant and equipment in the bottling departments having been responsible for the increase in their use in recent years. In many of these establishments, it has been found that quaternaries provide a satisfactory alternative to steam and boiling water, the more so because the practice of filling up the plant with the cold sterilising solution and leaving it overnight, or over the week-end, is now becoming general.

The economy in time and labour introduced by this method has more than offset the initial cost of the materials which, incidentally, have tended to become rather lower in price owing to improved means of production and larger consumption.

Pea canners in South Africa have found that the use of one of the quaternary series is invaluable for controlling flat sours, a disorder arising from a spore-forming micro-organism in the soil carried to the factory with the peas. Owing to the impossibility of eliminating this contamination at the source, it was necessary to seek some means of controlling it during the actual processing. The addition of a quaternary to the blanching water has been effective in preventing the germination of the spores and destroying the vegetative organisms. The wider use of these products has meant that fresh problems have had to be solved.

Adsorption Properties

To achieve its bactericidal power, a film of the surface-active substance is adsorbed on to the wall of the bacterial cell, certain parts of which are more susceptible to lysis rupture, permitting the escape of the intracellular material into the surrounding environment. The process continues with increased time of contact until the whole of the cell wall is removed and the organism disintegrated or dissolved.

The same property of adsorption takes place with all surfaces with which solutions of these materials come into contact, the metal, glass or other surfaces of the plant inevitably acquiring a film of quaternary ammonium compound which may be only a few molecules thick but is very strongly adsorbed, and may not be easily removed by the ordinary rinsing process. Normally, the film is invisible and does not demonstrate its presence by any untoward phenomenon, but in some cases conditions exist which focus attention upon this particular aspect of its properties.

Quaternaries and Soft Drinks

For example, in the soft drinks industry a variety of beverages are produced having a red, pink, green, or blue colour, these colours being obtained by the addition of approved colouring material to the syrup. Syrup mixing pans and plastic pipelines are effectively sterilised by means of quaternaries, but the subsequent introduction of the coloured syrup into the plant leaves behind a stain on the surface of the mixing pan and the plastic pipelines which is not removed when they are rinsed out after use. This is because the colouring matter has been absorbed by the adsorbed film of quaternary, thus making a dyed or coloured film, appearing as a discolouring stain.

It is possible to bleach out this colour with a solution of sodium hypochlorite, but this is unsatisfactory for two reasons: the average soft drink manufacturer is cautious about the use of chlorine compounds because of possible taint in the beverage and also corrosion; the bleaching of the film removes only the colour, and not the adsorbed film of quaternary. It can be demonstrated that the latter is still present simply by redyeing the film with some more syrup.

Film Removal Methods

Manual cleaning will remove the film, but this is a tedious way of overcoming the difficulty and, in the case of pipelines, not at all satisfactory. Obviously, if it is not controlled in some way, the film will gradually build up over a period of time into an observable sticky layer. Very often the correct use of detergents will prevent this, and under those conditions the film will never become noticeable unless more colour is introduced in the manner described.

A simple method of removing the film can be carried out after the sterilisation operation. When the quaternary solution has been run off, rinsing is effected by the use of a simple anionic wetting agent, such as a ¼ per cent. solution of sodium alkyl sulphate. On remaining in contact with the film for a few minutes, the solution removes it entirely, and subsequent rinsing with ordinary water leaves a clean and film-free surface. The application of this treatment once every seven or 14 days will overcome this particular difficulty common to all the surface-active quaternary compounds.

Some users are not certain whether these products are themselves detergents, and whether in that event the ordinary cleaning process can be omitted. The fact that solutions of these prepara-

tions foam to a greater or less degree serves to convey the idea that they may be utilised as cleaning agents. This has been known to lead to cases of neglect in carrying out the ordinary detergent cleaning process, resulting in accumulations of organic debris. This, rendered sticky by the adsorption of the quaternary with which it has been in contact, adheres to surfaces and pockets in the plant where such residues can remain unsuspected, revealing themselves only when it is evident that interference with the quality of the product being made has taken place.

It is true that to a certain extent the germicidal quaternary ammonium compounds may be classed as detergents, as are the anionic and non-ionic wetting agents, but the concentration at which these solutions would have to be used in order to bring about cleaning of the same order would be so high as to render them entirely uneconomical in use. In almost every case, it is certain that the actual recommended concentrations for sterilisation are totally inadequate to effect any positive detergency. While the anionic and non-ionic substances also adsorb to surfaces, they do so very much more weakly than do the quaternary ammonium compounds, and thus do not offer any problems when they are used in this way.

Proper cleaning should always be carried out where organic deposits have been left after processing, and it is unwise to omit such cleaning processes when any kind of chemical sterilising agent is being used.

Mould Growth Problems

One of the common troubles found in many food manufacturing establishments is connected with the growth and distribution of moulds. These may seriously affect the final product, and the presence of spores can pass undetected until a suitable environment causes them to germinate, when the food may be spoilt.

In this connexion, quaternary ammonium compounds are being used most effectively for the treatment of many kinds of surfaces which it is desirable to keep free from mould growth. Generally speaking, the concentration of active material necessary to destroy vegetative moulds is about five times the concentration normally used for the destruction of most ordinary bacteria, but very often considerably less suffices to prevent germination. While it can be demonstrated that these lower concentrations do not necessarily destroy the spores, they do inhibit any tendency of these to germinate when brought into contact with suitable food.

Recently, the application of quaternaries to such things as sausage skins, wrapping paper, cellulose film, and paper seals, has demonstrated their value. The spraying of walls and ceilings where mould growth is common has also proved to be a most effective means of keeping this under control.

In the canning of liquid egg these germicides have also proved their value, since keeping quality depends so greatly upon the highest degree of sterility of plant and containers. The power of adsorption to surfaces to keep these in a sterile condition for long periods is one of the most important factors.

Where necessary, the use of quaternaries has been greatly facilitated by one or two sound field test methods which enable the control of strength to be carried out without a difficult laboratory analysis, the stock solutions only having to be prepared previously. The details of field test methods can naturally be obtained from the manufacturers supplying the compound.

TO AUTHORS AND READERS

The publishers of FOOD MANUFACTURE invite the submission of manuscripts of books to be considered for publication. All manuscripts will be promptly acknowledged and carefully considered by qualified experts. A synopsis with chapter headings should be sent in the first instance, addressed to the Book Production Manager.

The publishers are specialists in industrial and scientific books and have a world-wide selling and distributing organisation.

Nutrition Research

A DESCRIPTION of developments arising from work on various nutritional and health problems is contained in the 1953 annual report of the Ovaltine Research Laboratories.

While evidence is accumulating to show that the amount of animal food needed may depend on the supply of vitamin B_{12} from dietary or intestinal bacterial sources, experiments on the fortification of human foods with the vitamin have revealed a number of unsuspected difficulties. In collaboration with the Laboratory of Human Nutrition, Oxford, valuable information is being obtained by a study of a group of volunteers who have been living for a number of years on diets practically free from animal protein and vitamin B_{12}. In some of these, symptoms are being observed of what appears to be dietary deficiency of vitamin B_{12}, which should provide the means of testing the efficiency of different levels of animal protein and vitamin B_{12} intake in man.

For the routine determination of vitamin B_{12} in foods and pharmaceutical products there would be advantages in replacing microbiological methods by rapid and reliable physico-chemical methods. It has been found that the 361 mμ band, which had proved so useful in measuring cyanocobalamin in aqueous solutions, such as injections, shifted its position, and hence had different Morton Stubbs corrections for the presence of irrelevant absorption. Various adsorption techniques for removal of impurities were adopted and methods were developed for determining the vitamin in certain types of foods and pharmaceutical products giving reasonable agreement with microbiological assays.

In order to stabilise vitamin content and avoid losses and variations in vitamin activity in natural foods, it is advisable to fortify them either with pure vitamins or with rich natural sources of them. As a result of investigations, it has been shown that direct fortification seems preferable to separate administration of the vitamins and experiments are now being considered to test these ideas.

Abstracts From Recent Food Literature

The Importance of the Technique in Meat Processing. H. Rievel (*Die Fleischwirtschaft*, 1954, **6**, 107).—The influence of technique in the production and processing of meat is described. Also the treatment of the meat after slaughter, its preservation by heat and curing, and its use in the manufacture of sausages.

U.V. Sterilising Lamps in Meat Processing Factories. F. Schönberg (*Die Fleischwirtschaft*, 1954, **6**, 117).—A survey of the scientific principles of U.V. sterilisation is given, together with a description of U.V. lamps and an outline of their practical employment in meat factories.

The Enzylac Process. A. B. Storrs (*Certified Milk*, 1953, **28**, 5).—Small amounts of pancreatic enzyme (1 part in 15,000) are added to the milk just before pasteurisation. As the milk heats up, the enzyme first hydrolyses the milk protein to some extent. Enzyme action is soon stopped by the rise in temperature by which time about 1 per cent. of theoretical digestion has taken place. The process lowers the curd tension and promotes the formation of softer and more flocculent curds. Further, the modification of the protein which has taken place means that it can be more rapidly broken down chemically, resulting in better and easier digestion.

New Herring Filleting Machine. (*Comm. Fish. Rev.*, 1953, **15**, 60).—A description is given of a new herring filleting machine placed on the Swedish market. It will fillet ordinary size herring, but can be adjusted somewhat for fish of other sizes, and has a capacity of about 10 barrels of herring per hour, corresponding to the filleting capacity of 20 to 25 persons.

A New Instrument for Testing the Tightness of Cans. (*International Fish J.*, 1953, **1**, 20).—The principle of the equipment for testing can leakages is described. The proposed system is claimed to be suitable for mass production in the canning industries.

Fuel Economy in the Chemical Industry. R. Walker (*Chem. and Process Engg.*, 1954, **35**, 137).—As one of the biggest users of fuel, the chemical industry can help considerably in the national duty of conserving the limited sources of fossil energy upon which the British economy depends. In this first part of a series, the author discusses the economics of fuel conservation, choice of heating medium, fuels, and the specifications of steam generating plant.

Remodelling of the Cold Storage Facilities of the Municipal Slaughterhouses, Dortmund. Labohm and Knierim (*Kältetechnik*, 1954, **6**, 100).—The cold storage plant of the Municipal Slaughterhouse at Dortmund, built 50 years ago, heavily damaged during the war and provisionally repaired in 1946, has now been replaced by modern machinery. For economic reasons, the previous system of a central refrigeration plant for all the six halls has been superseded by six separate cooling systems which can be better adapted to the changing demands. Complications arose from the need to avoid interference with operation as well as wasteful re-piping. In consequence of these modifications, the cost per animal in respect of water, coal, and electric current consumption has been drastically reduced.

New Chocolate Packages in Italy. (*Gordian*, 1954, **53**, No. 1281, 59).—The packaging of chocolate goods in Italy has, of late, been elevated to a fine art, both in respect of quality and variety of packing design. This is believed to be due to the particular importance ascribed to "eye appeal," and to the lack of firm regulations requiring the quantity of the contents to be stated on the package. There is therefore a tendency to offset an increase in the cost of raw materials by reducing the quantity rather than increasing the price, and to camouflage such reduction by the use of cleverly designed packages. A modern Italian chocolate packing machine can be adjusted, within a few minutes, to produce a great variety of packages of different sizes and designs.

A New Use for Plastics. J. de Kersaintgilly (*Revue Technique de l'Industrie Alimentaire*, 1954, **2**, March, 29).—A Paris printer (M. Jeanbin) has developed a new type of paper label with a plastic film which, when heated to 130°C., will firmly and immediately cling to any other material, *e.g.* glass, metal, wood, and Cellophane. Such "Drysec" labels are immediately dry so that the labelled object can be handled at once. There are no smudges, no enclosed air bubbles, and the labels are so resistant to cold water that they will not come off even after lengthy immersion. The material is therefore particularly suitable for wine bottles. It is also being used for fresh meat, the label being heat-fixed to the Cellophane wrapping without affecting the quality of the meat.

Greater Rationalisation Alleviates the Crisis in the Fruit Preserves Industry. D. Cagnoni (*Alimentazione*, 1954, **4**, March, 21).—With conventional jam and fruit preserve making steam-heated barrels are used, an intermittent process wasteful in terms of time required and steam generated. Improving on an earlier invention of his own, the author has designed jam and fruit preserve making apparatus which creates better conditions for the regular development of the osmotic process, and permits boiling without evaporation. In contrast to the earlier design, the apparatus is also suitable for the processing of raw materials containing sulphates or otherwise requiring greater concentration. The apparatus consists of a skip which tips the mixture of sugar, fruit, pectin, and colouring matter into a steam-heated syruping machine. The jelly is moved automatically into the boiler and, after boiling, into a container from which the finished product can be tapped.

Carotene in Palm Oil. (*Oléagineux*, 1954, **9**, 261).—Since 1946, the laboratories and overseas research stations of the French Research Institute for Oils and Oil Plants have devoted a great deal of work to the study of carotene in palm oil. In particular, the oil coming from the

vast natural palm groves of Dahomey and Togo are rich in carotenoids which yield, *inter alia*, the β carotene now much used as a colouring matter of butter, margarine, and ice cream as well as for controlled vitaminisation and livestock feeding. The results of this research programme are to be surveyed in a series of articles, the first of which, entitled "General Notes on Carotenes" and written by P. Cuvier, is published *loc. cit.* It deals with the constitution and properties of carotenes, their chromatography, and standard quantities of admixture.

Hormone Treatment on Pineapple Plants. C. Py and A. Silvy (*Fruits*, 1954, **9**, 101).—A detailed account of the latest results of systematic research work, carried out in French Guinea by the *Institut des Fruits et Agrumes Coloniaux*, in connexion with the application of hormone treatment to improve the growth of pineapples. The authors discuss the economic advantages to be derived from such treatment under conditions in French Guinea; the prerequisites for such treatment; the selection of suitable plants; the methods used; the inflorescence phenomena and how they can be used to assess the value of the crop; the appropriate phasing of the treatment; and the importance of the acetylene treatment. They finally outline, for the guidance of planters, a scheme for the systematic application of hormone treatment.

Trace Elements in Edible Oils. G. Gorbach and A. Vioque-Pizarro (*Fette, Seifen, Anstrichmittel*, 1954, **56**, 177).—It is difficult to determine traces of metal elements in edible oils if these elements are not dissociated, in which case the oil must be incinerated. During incineration there is a danger of foaming and a risk that traces of foreign metal elements are unwittingly added during the process. As a result of co-operation between the Institute for Biochemical Technology and Food Chemistry at Graz Technical College, Austria, and the Institute for Fats and Fat Derivatives at Seville, Spain, a new method has been devised, based on the use of magnesium nitrate, and of a specially designed electrically heated block for incinerations of the oil, the ash being subsequently examined spectrographically. Values of metal traces in a number of oil samples are tabulated, and a comparatively high copper content of the unsaponifiable matter was noticed.

Variations in Porosity during the Ripening Process of the Banana. G. Forti (*Fruits*, 1954, **9**, 124).—In conjunction with tests carried out as a result of collaboration between Italian and French refrigeration research workers, it was found that the porosity of the banana varies greatly in the course of the ripening process, showing a very pronounced minimum. The curve is rather similar to that showing the intensity of respiration as a function of time. It is also similar to a curve showing the porosity of William pears as a function of the ripening process. These phenomena are believed to be closely related to the transformation of the pectic constituents of the membranes.

Conching and Processing of Chocolate. (*Gordian*, 1954, **53**, No. 1282, 30).—Following a brief survey of the history of the process known as conching, the different phases of the conching process are discussed, distinguishing between "dry conching" and the subsequent phase of the process which serves to develop and refine the aroma and to continue the emulsification. After a description of the different actions forming part of this phase, attention is drawn to certain differences in the processing of chocolates of normal and high quality. The different types of conches are briefly described, and the importance of ensuring fresh air access during the conching process is emphasised.

Determination of Water Contents in Meat and Meat Products through Measuring the Dielectric Constant. K. Möhler and K. Slevogt (*Fette, Seifen, Anstrichmittel*, 1954, **56**, 46).—The authors have designed a short-cut method which permits the determination, with adequate accuracy, of the moisture contents in meat and meat products by measuring the dielectric constant which increases with the water contents. Although the principle had been known for over 20 years, its application to the food industry in general and to the meat industry in particular is of comparatively recent date. Certain difficulties had been overcome by admixing dioxan, but it is only through the use of a dioxan/ethylene glycol mixture known as "Eluol 167" that the method has now become reliable enough for systematic use, at least in specified cases where rapidity of determination is more important than a high degree of accuracy.

Scientific Principles for the Selection and Development of Food-protecting Packaging Materials. R. Heiss (*Fette, Seifen, Anstrichmittel*, 1954, **56**, 49).—The author discusses the principles which should govern the choice of packaging materials with the dual function of preserving as well as wrapping perishable foodstuffs. Among the external conditions against which a good packaging material should afford protection, are the influences of gases, vapours, and aromatic substances, bacteria, fungi, insects, and light. In addition, it must have a given mechanical strength and must, with many food products, have an adequate impermeability against water or oil. Discussing these various properties in turn, the author comes to the conclusion that there is still a great field for research which could be furthered by systematic co-operation between food manufacturers and research institutes.

The Sugar Industry in India. S. Ramanath (*World Crops*, 1954, **6**, 239).—Sugar has always been an important crop in India, but the expansion of sugar production is one of the most remarkable developments of the past 20 years. The author gives an account of the industry and the manner of its extension to today's proportions.

Effect of Calcium Removal by Ion Exchange on the Properties of Fluid Milk. R. D. Coleman, S. J. Bishov, and J. H. Mitchell (*Food Tech.*, 1954, **8**, 211).—This paper describes the use of synthetic resinous ion exchangers in the removal of calcium from milk. A larger portion of calcium may be removed from milk with less change in sensory rating by the use of anionic and cationic resins in intimate mixture than by the use of these resins singly or in series.

Cider Sampling Day, 1954

Mr. J. H. Alpass, member of the Agriculture Committee, University of Bristol, Mr. F. Holloway, Governor of the Cider Institute, and Mr. C. R. Maxwell Eley, of I.C.I., discuss and ponder over the samples.

A LARGE number of cider makers, growers, and others were present at the Annual Cider Sampling Day at Long Ashton.

In the last two years, greater attention has been given to perry, and the first part of the programme was devoted to a selection of perries chosen from the large number made in the vintage trials of 1953. The high quality of some perries made from fruit grown on soils said to be poor for pears suggests that some of the old traditions of perry making may be misleading. Others, however, are undoubtedly correct, as for example the importance of milling the fruit at the right state of maturity. These points were brought out by some of the perries exhibited. Blended perries were also shown, and a full-bodied blend of Moorcroft and Yellow Huffcap, the latter a variety of great renown, aroused a good deal of enthusiasm.

The second part of the programme illustrated the effects of fermenting ciders with pure yeast cultures rather than with the natural flora of the juice. The yeasted ciders were unanimously preferred to the normally fermented cider, which had undergone a mixed yeast and bacterial fermentation. The cider receiving the most votes had been fermented with Steinberger yeast. It is to be doubted if the process of sterile juice filtration and addition of pure yeast cultures would be practicable in commercial cider making; methods of fermentation that encourage the growth of the more desirable members of the natural flora provide a simpler alternative.

The value of standardised pure yeast fermentations in experimental cider making and vintage trials was brought out by a series of ciders showing the effects of site and of fruit maturity on cider quality. A natural uncontrolled fermentation often brings in unwanted effects due to bacterial fermentations which obscure the effects of the factors being studied; a standard pure yeast fermentation overcomes these difficulties.

The last section of the programme showed a series of ciders made from little known early varieties from Devon. A longer making season would be of great advantage to the cider maker and a greater selection of good early cider varieties would go far to help. The ciders shown were made from varieties of good local repute and included sweets, bittersweets, bittersharps, and sharps. Good early vintage sharps would be particularly useful for blending with the main early variety Morgan Sweet which has several disadvantages when used alone; blends of this type were shown.

In the afternoon, other ciders and perries were made available for tasting and exhibits were on view in the Cider House. These included the results of pollination experiments on cider apple varieties and other topics related to cider making.

The possibility of metal contamination is a problem often presented to the cider maker in view of the acidity of his product. A demonstration of simple methods for detecting iron and copper included in the programme aroused considerable interest.

A number of plantation tours were arranged in the afternoon and demonstrations of grafting methods, frameworking and routine spraying operations were given.

Stable Starch Indicator

A STABLE starch solution for use as an indicator in iodimetry has been developed by W. D. Nordling of Grinnell Co., U.S.A. (*Chemist-Analyst*, September, 1953, p. 70).

The solution is prepared by mixing 50 ml. of glycerol and 50 ml. of distilled water. This is brought to the boil and 1 g. of soluble starch mixed with 2-3 ml. of water is added. The resultant mixture is boiled for a further three minutes. It is then cooled to room temperature for use or store.

The author states that a solution made from the above formula showed no signs of deterioration after six months and that in using it in the evolution method for determining sulphur, he got a colour identical to that obtained with a fresh aqueous solution of soluble starch.

FUTURE ARTICLES

AMONG the articles to be published in forthcoming issues of FOOD MANUFACTURE are the following: "The Manufacture of Active Dried Yeast," "The Higher Alkyl Gallates," "The Manufacture of Cucumber Products in Sweden," "The Drying of Vine Fruits," and a description of the Kenya Meat Commission Factory at Athi River, Nairobi.

News from the Industry

FORTHCOMING EVENTS

The Society for Applied Bacteriology

The Annual Meeting and Summer Conference of the Society for Applied Bacteriology will be held in Edinburgh during the week commencing July 5, 1954. Original papers will be presented on the mornings of Tuesday and Thursday, July 6 and 8, and on Wednesday a symposium will be held on "Yeasts and Alcoholic Fermentations." This will include papers on techniques of the study of yeasts, and on their production and uses in the fermentation industries.

The remainder of the conference period will be taken up by visits to places of local interest.

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The Nutrition Society

On Friday and Saturday, July 23 and 24, the Nutrition Society will hold a symposium at the University College of North Wales, Bangor, on "The Efficiency of Food Conversion in Farm Animals."

The symposium will comprise three sessions:

1. On dairy cattle, on Friday morning.
2. On beef cattle and sheep, on Friday afternoon.
3. On pigs and poultry, on Saturday morning.

R.I.C. Cambridge Meeting

About 450 members and their wives attended the Royal Institute of Chemistry Anniversary Meeting held at Cambridge from April 8-10, the hosts on this occasion being the London and East Anglia Sections of the Institute.

On the first day, visits were arranged to the establishments of the Cambridge Instrument Co., Chivers and Sons, and Pest Control, after which Alderman G. F. Hickson, M.A., entertained the visitors with a lecture on the town and University. In the evening, a civic reception and dance took place in the Large Room of the Guildhall by invitation of the Mayor, Councillor T. H. Amey, J.P., guests being received by the Mayor and Mayoress, Sir Harry Jephcott (President) and Lady Jephcott.

Among other functions held on following days were the Annual General Meeting at which Sir Harry Jephcott delivered the Presidential Address entitled "Biosynthesis and the Chemist," in which he outlined developments in the use of biosynthetic processes for the commercial production of a number of products, including antibiotics, and discussed the possible future role of biosynthesis as a complement to chemical synthesis, which would involve the combined efforts of biologists and chemists.

Prof. A. R. Todd, F.R.S., lectured to a crowded audience on "New Developments in Nucleic Acid and Co-Enzyme Chemistry," which took the form of a survey of some of the Department's work in organic chemistry over the past 15 years.

Owing to the very large number attending the meetings, it was necessary to hold the Annual Dinner in two parts—the President's Dinner in Trinity and the Dinner of the Past President (Mr. H. W. Cremer, C.B.E.) in St. John's. At the former the toast of the Institute was proposed by Prof. W. Wardlaw, C.B.E. (President of the Chemical Society), and replied to by Sir Harry Jephcott, after which the toast of the guests was proposed by Dr. Norman Booth (Chairman of the London Section), to which Dr. F. G. Mann, F.R.S. (Fellow of Trinity College), responded. At St. John's, Prof. Todd proposed the toast of the Institute, to which Mr. Cremer responded, and Dr. H. Baines (retiring Vice-President) that of the guests, replied to by Miss Mamie Olliver.

A large audience attended the lecture by Prof. R. G. W. Norrish, F.R.S., on "Light as a Tool in the Study of Reaction Mechanisms," held on the morning of the final day. This took the audience through the work of the Department of Chemistry over a number of years and presented an interesting account of the present state of work in this field.

The last event on the formal programme was the reception given by the Vice-Chancellor of Cambridge, the Rt. Hon. H. U. Willink.

Chemical Society Conversazione

The President, Prof. William Wardlaw, C.B.E., D.Sc., and Mrs. Wardlaw received Fellows and their guests at a well-attended reception and conversazione held at the Senate House, University of London, by the Chemical Society on May 7 by kind permission of the University authorities.

During the evening, five scientific films were shown:

"The Gift of Ts'ai Lun." Manufacture of paper in all stages. (United States Information Service.)

"Acid and Solvent Refining. Parts I and II." (Petroleum Films Board.)

"New Detergents." How detergents work; increased efficiency of new detergents derived from petroleum by-products. (Petroleum Films Board.)

"The Making of the Soil." Chemical and biological processes in the formation of soil. (Ministry of Agriculture.)

"The ABC of NPK." How a balanced artificial fertiliser works, and methods of application to the soil. (Fisons Ltd.)

A large selection of exhibits was provided by the British Coal Utilisation Research Association; British Drug Houses; Courtaulds; Johnson, Matthey and Co; Laporte Titanium; the Dyestuffs Division of I.C.I., and Plant Protection.

The Royal Sanitary Institute

Reference to the setting-up of a Standing Committee on the hygiene of food and food equipment, representing all sections of the food and catering industries, is contained in the annual report of the Royal Sanitary Institute.

The report was approved at the annual general meeting of the Institute held in London on May 18, when Lord Percy of Newcastle presided over a good attendance of members.

In a review of the Institute's activities during the previous 12 months, it was stated that a new policy of staging special exhibitions dealing with various aspects of health education had been an unqualified success.

Considerable development has also taken place in the Institute's library which, it is claimed, comprises one of the largest collections of works on health in the United Kingdom.

The following were elected or re-elected to the Council of the Institute: Mr. George Lloyd Ackers, Chief Sanitary Engineer, Ministry of Works; Mr. E. Gardner Thorp, Borough Engineer and Surveyor, Slough; Mr. Charles Bruce Townend, O.B.E., Middlesex County Main Drainage; Miss E. Robinson, Chief Nursing Officer, London County Council; Miss F. N. Udell, Chief Nursing Officer, Colonial Office; Dr. A. Scott, O.B.E., M.D., D.P.H., M.O.H. London County Council; Dr. J. W. Starkey, M.O.H. Kingston-on-Thames; and Mr. Robert Cross, Chief Sanitary Inspector, Brighton.

In addition, Mr. J. B. Thomson was re-appointed Treasurer, and the meeting also agreed to the election or re-election of 17 Vice-Presidents, including the Duke of Northumberland, the Earl of Bessborough, and Lord Woolton.

Chemical Society Elections

New President of the Chemical Society is Prof. W. Wardlaw. Other elections announced at the recent annual general meeting included:

Vice-Presidents (who have not filled the Office of President): Profs. E. R. H. Jones, R. P. Linstead, and H. W. Melville; *Treasurer:* Mr. M. W. Perrin; *Secretaries:* Profs. H. Burton, E. D. Hughes, and Dr. L. E. Sutton.

The annual subscription has been cut to £2 2s. p.a. to encourage new members, especially younger ones.

F.M.A. Annual Luncheon

IMPORTANCE OF TECHNICAL TRADE PRESS EMPHASISED

The fourth annual general meeting of the Food Machinery Association was held on May 20, when the Council presented its report for the year ended December 31, 1953, which was adopted. The following elections were made:

President: Mr. J. Matthews (The A.P.V. Co.).
Chairman: Mr. C. S. Robinson (Thos. Robinson and Son).
Vice-Chairman: Mr. L. A. Moody (Wm. Brierley, Collier and Hartley).
Hon. Treasurer: Mr. A. Graham Enock (Graham-Enock Manufacturing Co.).

The meeting was preceded by the Annual Luncheon at which the guest of honour was the Rt. Hon. D. Heathcoat Amory, M.P., Minister of State, Board of Trade.

In his speech proposing the toast of the guests, the chairman, Mr. J. Matthews, said that he personally set great store by co-operation with the associations representing users of equipment, because he felt that the manufacturers should take every possible step to find out the real needs of the industries they served, as distinct from developing new equipment to sell, on the one hand, and obeying a single purchaser's whim, on the other. Therefore, he welcomed the excellent work being done by the Joint Technical Committee set up by the Food Manufacturers' Federation and the Food Machinery Association, and the part which the Association's Packaging and Labelling Machinery Section had played in co-operating with the Institute of Packaging.

He was sure that the establishment of the National College of Food Technology would be welcomed and expressed the hope that both sides of the industry would see to it that it was well and properly supported.

In welcoming representatives of the technical trade Press, the chairman said that the industry was lucky to have a series of first-class trade journals, thoroughly representative of the industry, alert and active in progressive journalism, with balanced judgment, a sound record for accuracy, and entirely free from sensationalism. He made a plea that a rather wider view of the value of the trade journal should be adopted and that it should not be looked upon merely as an advertising medium. He was sure that the technical trade Press, in educating the younger members of the industry and providing a medium for an exchange of knowledge and experience, was an extremely important factor in the sound development of the industries with which the Association was connected.

In the course of his speech, he commented on the export figures contained in the Trade and Navigation Returns. He hoped that the Board of Trade would find it possible in the near future to give export and import information analysed in greater detail than at present, for it was most difficult to obtain an accurate measure of the performance of a given section of the industry, and to watch how exports of any particular class of equipment rose and fell. He also referred to the backing given by their respective Governments to our competitors abroad. He would like to see some attempt made to match that competition by streamlining our export credit service, reducing the cost, and, above all, speeding up negotiation. He expressed appreciation of the successful efforts of the F.B.I. and of the Government in achieving, through their respective channels, a standstill agreement on the introduction of further export incentive devices. He hoped that they would eventually be successful in securing the complete abolition of such devices.

In his reply on behalf of the guests, Mr. Heathcoat Amory expressed his thanks to members of the Association for the very co-operative attitude the industry had shown to the Government of the day, and their keen interest in and the great efforts they devoted to the export trade. It seemed to him that theirs was exactly the kind of industry that should be developed as fast as possible.

The industry seemed to be very much alive to the value of publicity and, as the chairman had remarked, publicity in the technical Press was important. He believed that in this country we were fortunate in having an excellent technical Press, it being essential that it should receive as wide a distribution throughout the world as possible.

Other subjects covered by the speaker were the overseas fairs and their value for British exhibitors. As for competition, he was sure that the Association knew more about that than he did! From the Government's point of view, however, over the whole field, he would say that we were just competitive, although we had no margin to spare.

On the subject of the Government's job, Mr. Heathcoat Amory considered that by carrying out the right policies it must try to create the kind of atmosphere and conditions in which industry could do its job. Further, by negotiations with other countries it must try to open up as many as possible of the markets which were now closed, and to keep those markets open. Other tasks included the provision of commercial intelligence to overseas officers to enable them to give service and of insurance services to industry.

He favoured multi-lateral as opposed to a multiplicity of bi-lateral trade agreements, giving a number of reasons for this. Long-term credits, export subsidies, productivity, and salesmanship were other topics briefly touched upon.

Finally, Mr. Heathcoat Amory said that there were plenty of problems and difficulties but, given flexibility, resource, and energy, he believed British industry would give a very good account of itself.

Chemical Analysis of Ice Cream

In the series of British Standards which have been published for methods of determination of dairy products, the British Standards Institution have just issued a further document, B.S.2472, "Methods for the chemical analysis of ice cream."

In view of the great number of recipes for ice cream, it is not possible, at present, to frame a British Standard which would cover methods of determination for all compositions. The standard in question therefore confines itself to standard determinations which can be made accurately, but it does not give recommendations as to their interpretation in terms of composition.

At this stage, it has not been found possible to lay down methods for the direct determination of non-fatty milk solids, lactose, and sweetening matter other than sucrose. It is hoped that it will be possible to include determinations for those constituents in a later edition.

The standard includes sections covering the preparation of the sample, and the following determinations: total solids, fat by the Röse-Gottlieb method and modified Werner-Schmidt method, sucrose and reducing sugars, nitrogen, ash, calcium, and phosphorus.

Bakery Research

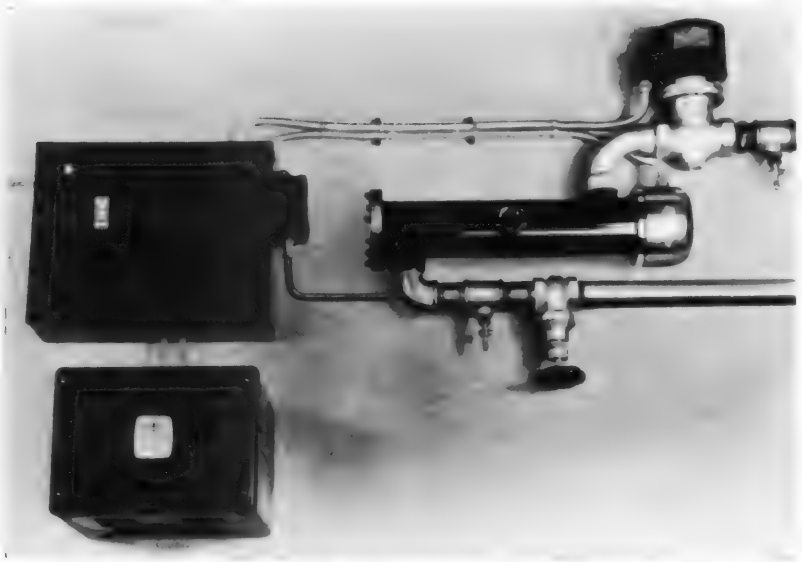
By invitation of the chairman, council, and director of the British Baking Industries Research Association, a party consisting of members of the Food Group of the Society of Chemical Industry recently visited the research station at Chorleywood.

A full and interesting afternoon was spent in the various laboratories, the work of which was explained by the chemists engaged in them.

In the evening, the visitors attended a lecture "Science and the Baker," given by the director, Dr. J. B. M. Coppock, at the Chorleywood Memorial Hall.

Holiday Closure

As in previous years, Gale and Mount will close for two weeks from July 23 to August 8 to allow for annual holidays. During this period it will not be possible to accept or effect any deliveries.



The Hanovia ultra-violet water and fluid steriliser with automatic control unit. Models for delivering up to 2,000 gal. of sterile water per hour are available.

Ultra-violet Rays in the Food Industry

The bactericidal effect of ultra-violet rays has been known for over 60 years, but it is only comparatively recently that any serious attempt has been made to exploit them as a means of preventing infection, and consequent spoilage of food products by air- and water-borne germs and spores. All known bacteria, viruses, and microscopic fungi will succumb to a sufficiently powerful dose of radiation of the right wave-length.

Designed to offer to the food manufacturer an effective protection against infection in a number of different situations is a range of equipment manufactured by Hanovia of Slough. The water steriliser, made in two models for manual or fully automatic control, will deliver up to 2,000 gallons of sterile water per hour, even from a grossly contaminated source of supply. Air sanitation units can be provided for fitting to storage tanks to prevent nutrient liquids becoming contaminated by air-borne moulds; they can also be fitted over conveyor belts and filling machines where there is a risk of infected air being drawn into cooling containers, or in the air conditioning ducts supplying storage and process rooms.

A New Polythene Film

Having one surface keyed by a special process, the main purpose of which is to ensure that the film can be successfully printed by normal methods, a new film called "K" polythene, has been developed by British Cellophane.

Hitherto, the resistance of polythene film to chemicals, although an important advantage in many respects, has been an obstacle to effective printing. It has proved very difficult to get inks to adhere firmly enough to withstand even normal handling. It is claimed that the new film successfully overcomes this problem.

Tests with a large number of printing inks carried out by the company's Research and Development Division have shown that the specially treated surface of the film gives excellent adhesion with the majority of inks. These tests have also proved that the keying process in no way affects the film's other properties, *e.g.* its chemical resistance, flexibility, moistureproofness, heat-sealability, purity, and toughness.

Apart from its suitability for printing, the keyed surface gives improved adhesion in laminations and in the manufacture of pressure-sensitive tape.

Vegetable Preservation

The F.M.S. method of vegetable preservation was demonstrated at the British North Greenland Exhibit at the B.I.F. by F.M.S. (Farm Products), who were suppliers to the British Polar Exhibition.

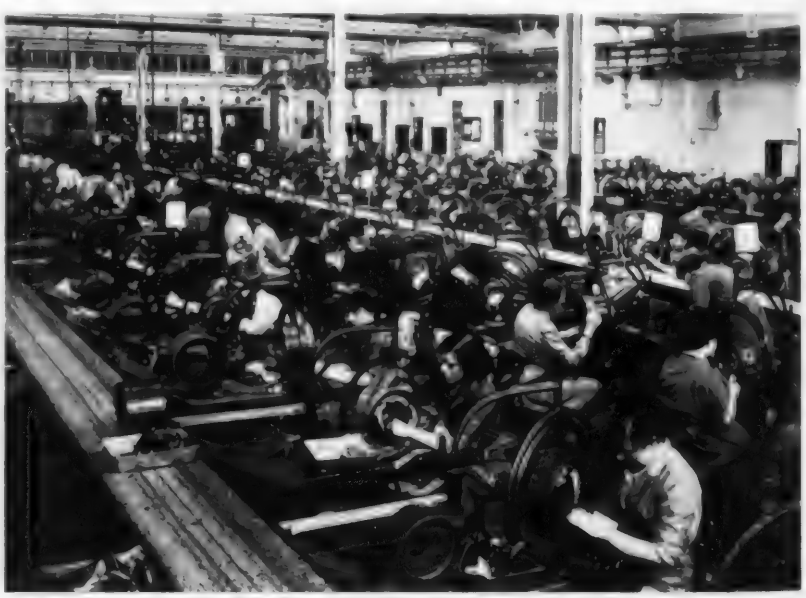
Tanker Distribution Scheme

The Scottish Milk Board's tanker distribution scheme incorporates refrigeration equipment in the form of an installation by Refrigeration (Mitton) Ltd. of some 125 Prestcold refrigerated 180 gallon to 300 gallon tank milk cooling units on farms over a wide area. The scheme enables milk to travel direct from cows handled by automatic milkers through sterilised pipes to each refrigerated tank, from which another sterilised pipe conveys it to a mobile refrigerated tanker.

New Barnsley Factory Opened

On May 28, Sir John Keeling, chairman of the Yorkshire Woollen and Worsted Federation, opened the new Brook Motors factory at Barugh Green, Barnsley, where a large winding department and the control gear section are housed. Stator frames with stampings pressed in are brought by articulated truck service from the Huddersfield works. Sets of coils are wound and inserted and, after connexion, the wound motors are tested, impregnated in insulating varnish, baked, and then transported back to Huddersfield for assembly.

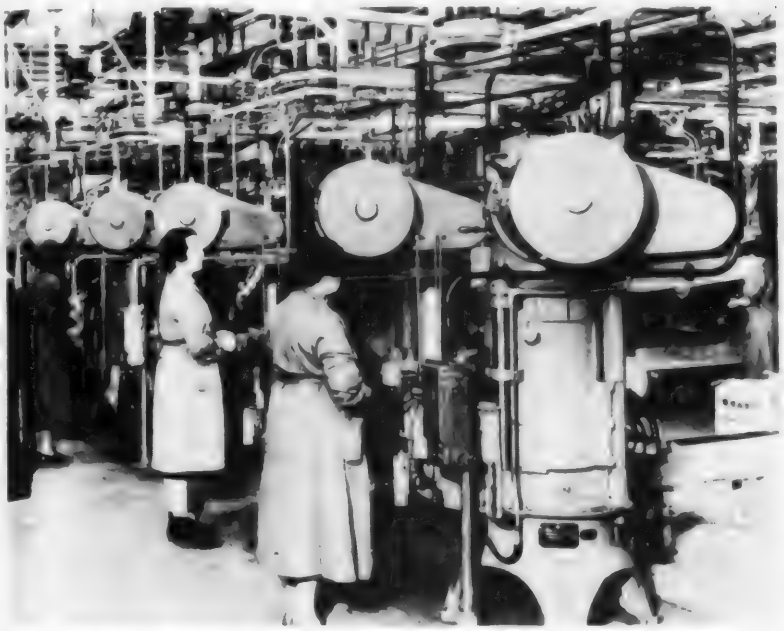
The winding of about 300 stators in all sizes from fractional horse power to 5 h.p. is accomplished daily on an electronically controlled conveyor system devised and made by the electronics and production planning departments.



A general view of the winding conveyors at Brook's new Barnsley factory, where three lines are at present in operation.

The Manufacture of Food Cans

OPEN DAY AT NEW WISBECH FACTORY



A battery of end seamers in operation at the new Wisbech factory.

The newest processed food can factory to be erected by The Metal Box Co. has now come into operation at Wisbech. At the Open Day on May 5, visitors saw 400 operatives working to produce over eight million cans a week.

Heated and air-conditioned throughout, the factory is equipped with six can lines, extensive can runway installations, and a press department.

Tinplate, which has been previously lacquered at another Metal Box factory, is delivered right inside the factory from the railway siding by means of fork lift trucks, and then follows the complicated sequence of engineering operations for the fabrication of the cans. The finished cans are conveyed by a network of runways from one machine to the next, finally entering the rotating testing machine which will accept 80 cans at any one time. Each is held with its open end firmly pressed against a rubber pad and is subjected to internal air pressure in order to detect leaks. Minute pin holes of as little as ·002 in. in diameter can be detected. All leaking cans are automatically rejected, the remainder passing on to the packing bays.

With each line producing up to 400 cans per minute, the output of the Wisbech factory is so great that rapid clearance from the factory by road and rail is necessary. A fleet of lorries handles regular deliveries to customers and trainloads of finished cans leave the factory siding daily.

The building, finally completed in the summer of 1953, incorporates a covered railway siding, storage and office accommodation, and a modern canteen and surgery; a sports ground for the use of employees has also been provided.

Food Machinery in the Royal Yacht

Five food preparing machines have been supplied by Peerless and Ericsson to the Royal Yacht, *Britannia*. Three of these are 20 qrt. mixers with attachments for mincing, soup straining, slicing, and bread crumbing; the remainder comprise two bench type potato peelers each capable of handling 14 lb. of potatoes per minute.

Eight destroyers of the *Daring* class, two of which escorted the Royal Yacht, are also equipped with the company's potato peelers and mixers.

Flavouring Material

A new product made by Th. Muhlethalers is to be marketed by Gale and Mount under the name of maple lactone crystals.

This material is recommended for use in the manufacture of tobacco flavours, and for coffee and walnut essences and similar purposes. It should be of great interest in the flavouring industry but might also be of interest to the perfumer looking for a sophisticated fixative.

It is slightly soluble in water and soluble in 70 per cent. alcohol to the extent of 15 per cent.

Detergents in Ireland

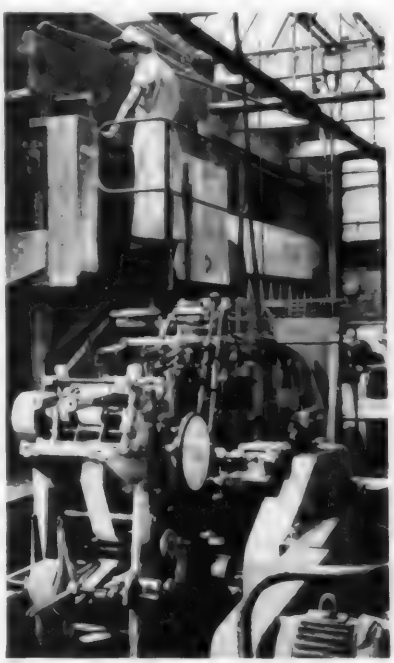
Manufacturing and selling arrangements have been concluded with Industrial Services Ltd., 118, Grafton Street, Dublin, Ireland, whereby they will be manufacturing a wide range of British Hydrological Corporation products under licence for sale in Ireland.

Mass-produced Snofrutes

After 13 years, Wall's Snofrutes, produced by an entirely new method, are again on the market.

Before 1939, Snofrutes were made by what was known as the "moulds process," the mixture being poured by hand into moulds and left to freeze solid, either in a brine tank or cold room. The wrappers were then put on by hand.

By the latest method, a new automatic plant deals with the entire production. The machine forms the cartons from a continuous reel of specially treated wrapping material; these are electrically heat-sealed before passing to a conveyor and are then transferred, still automatically, to metal carriers in batches of 18. These carriers are attached to a moving chain system which brings them into position under a filler-tank containing orange juice. Once filled, the cartons, still in an upright position, pass through a 22 ft. long freezing tunnel similar to those used for producing ice cream brickettes. There are 150 carriers, each holding 18 Snofrutes, which leave the rear of the tunnel for packaging in bundles before despatch.



Wall's new plant for producing Snofrutes. The fully automatic plant forms cartons, heat seals them electrically, and transfers them to a conveyor for filling with fresh fruit juice for freezing

New Sieving Method for Army Bakeries

On behalf of the War Office, the Ministry of Supply has purchased 25 gyratory sieving machines from Russell Constructions for installation in army bakeries for sieving flour.

The exclusive characteristic of these sieving machines is the gyratory motion which they impart to the material that is being processed. It results in an easier passage of the particles through the mesh and permits the user to fit a 30-mesh sieve instead of the eight-mesh used with the shaker type of screen, which removes not only inorganic impurities, such as fragments of string and metal from the flour, but also weevils which are liable to develop in stored flour.

Russell gyratory sieving machines are now being used in many industries. They are helping to produce smoother chocolate, more closely textured paints, fine powders and pastes for the toilet and pharmaceutical trades, powdered metals and plastics with exceptional uniformity of particle size, and ingredients of remarkable purity for paper manufacture. Certain substances, hitherto impossible to screen, are now being handled successfully by these machines.

Changes of Address

In order to provide better facilities for delivering and collecting work for the trade, Samuel Jones and Co. have transferred their Varnishing and Embossing Departments to Wren Road, Camberwell Road, S.E.5 (Telephone: RODney 6173). Although the Hand Gumming, Sheet Gumming, and Cellulose Departments will remain at Peckham Grove, all telephone and written enquiries should be made at the new address.

*

The new address of the Divisions and subsidiary companies in the D.C.L. Industrial Group is Devonshire House, Mayfair Place, Piccadilly, London, W.1, and the new telephone number, MAYfair 8867, will be common to the London offices of British Geon, British Industrial Solvents, British Petroleum Chemicals, British Resin Products, The Carbon Dioxide Company, Commercial Solvents (G.B.), D.C.L. Engineering Division (Southern Office), D.C.L. Industrial Alcohol Division, D.C.L. Transport Dept., D.C.L. Industrial Group Publicity Dept., D.C.L. Yeast and Malt Extract Dept., The Distillers Company (Biochemicals), F. A. Hughes and Company, Honeywill and Stein, and The Methylating Company.

Associated with these changes, Magnesium Elektron Ltd. will move to Distillers House, 20-21, St. James's Square, S.W.1 (Telephone WHItehall 1040).

The telegraphic addresses of the various units remain unchanged.

Mechanical Handling

A complete range of material handling equipment was shown at the recent exhibition by Fisher and Ludlow. On show for the first time was the Flowlink Cadet chain conveyor, a light duty version of the standard type, and the Fisholow-Hapman tubular conveyor, a system of *en masse* conveying.

Adhesives for Food Cans

For a number of years, satisfactory adhesives have been available to give adequate and permanent adhesion of spot labels to plain and lacquered cans, but the texture and consistency of these adhesives have not been suitable for application on automatic and semi-automatic machines of standard types.

Extensive field tests have shown that Gum 463, made by National Adhesives, operates continuously on these machines without splashing or webbing, has the initial tack to give a positive label pick-up, and provides complete adhesion to cans whether plain, lithographed, or lacquered. It is formulated to reduce rust formation when used on plain cans.

APPOINTMENTS AND RETIREMENTS

Mr. G. M. Shepley has been appointed Secretary of Brook Motors in place of Mr. Willie Mills, who has resigned owing to ill health but remains on the Board of Directors.

*

Mr. H. R. Acton.

Mr. H. R. Acton, formerly Buying and Welfare Director with Fry Cadbury (Ireland), has joined Fredk. Boehm Ltd. and Miloko Products Ltd. to take charge of their sales to the food industry.

*

Mr. J. Richmond has been appointed London manager of Rhodes, Brydon and Youatt and is responsible for the sales organisation in the London area covering both the heating, ventilating, and industrial user fields.

Mr. C. W. Haydon has been appointed technical representative for pumps used for heating, ventilating, and air conditioning. Mr. M. J. B. Hodgson continues to represent the company's interests in the industrial user market.

*

At the annual general meeting of The Institute of Physics, Sir John Cockroft (Director of the Atomic Energy Research Establishment at Harwell, and chairman of the Defence Research Policy Committee), was elected President.

Mr. G. R. Noakes was elected a Vice-President, Dr. S. Whitehead was re-elected Honorary Treasurer and Dr. B. P. Dudding re-elected Honorary Secretary. The two new Ordinary Members of the Board are Dr. K. A. G. Mendelssohn and Mr. H. P. Rooksby.

*

The Committee of the Agriculture Group of the Society of Chemical Industry has elected the following Honorary Officers for 1954-55:

Chairman: A. W. Marsden, M.Sc., D.I.C., A.R.C.S., F.R.I.C.
Vice-Chairman: G. W. Cooke, Ph.D., B.Sc., A.R.I.C.
Hon. Secretary: A. H. Cornfield, M.Sc., Ph.D., A.R.C.S., A.R.I.C.
Hon. Treasurer: J. H. Hamence, Ph.D., M.Sc., F.R.I.C.
Hon. Recorder: W. Leonard Hill, Esq.

*

In recognition of his outstanding service as a director for 29 years, 18 of them as chairman, the stockholders of H.P. Sauce agreed on May 27 to grant a £1,250 a year pension to Sir Patrick Hannon to date from his retirement.

Of Sir Patrick's decision to retire from the Board, Mr. Stanley Adams, director, said at the annual meeting in Birmingham that under the circumstances there was no alternative but to accept it with regret.

At the annual meeting, Mr. John T. Lewis, Mr. H. G. Wright, Sir Eustace Missenden, and Mr. Stanley Adams were re-elected directors. It was intimated that the Board would appoint Mr. Lewis as chairman of the parent Board and of all the subsidiaries, with the exception of Lea and Perrins to which Col. C. F. D. Perrins has been elected chairman.

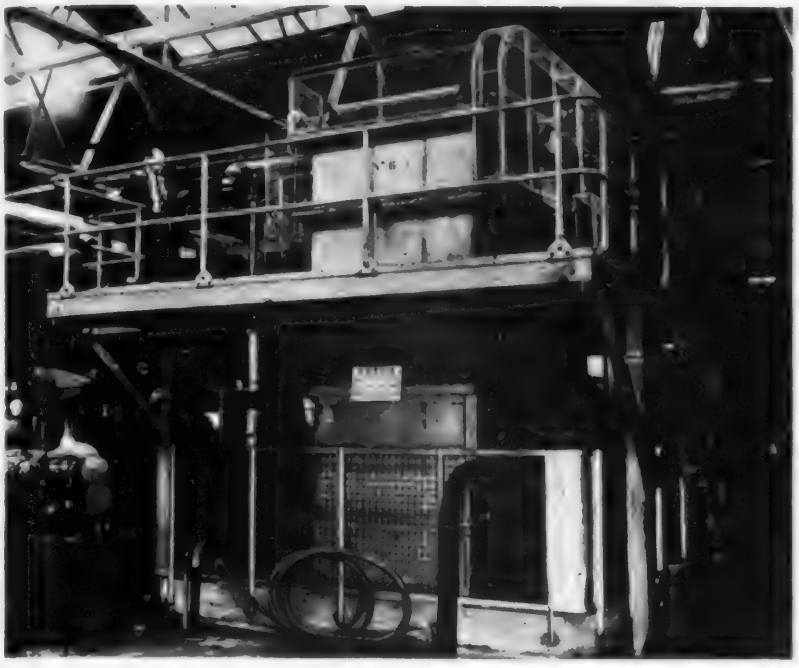
Talking Turkey

The British Turkey Federation are in close touch with the U.S.A.A.F. Authorities regarding the possibility of supplying them with British turkeys this year. Applications are therefore invited from poultry packing stations wishing to quote for this business. Communications should be addressed to the Secretary of the B.T.F., Chartley Hall, Stafford.

U.S. veterinary authorities require to certify premises before any definite order is confirmed. All birds will require to be eviscerated and packed according to U.S. specifications.

Exhibition of Wall Charts

Among the exhibits of wall charts and other visual aids shown at a recent exhibition by Illustrated Classroom Education were training charts designed for oil and chemical organisations and other major industrial concerns, together with charts depicting safety for personnel in picture form.



The Carvallo pressure cooker processes at the rate of 12,000 cans of peas an hour. It is 40 ft. high, weighs 35 tons, and is sunk into a 27½ ft. deep pit.

Batchelors New Pea Canning Line

40 FOOT PRESSURE COOKER INSTALLED

One of the world's largest pressure cookers was recently set in motion at Sheffield by Lt.-Col. Maurice W. Batchelor, chairman of Batchelors Peas.

It was early in 1952 that the decision was taken as part of the company's expansion scheme to set up a new canning line, incorporating a Leviathan cooker from France, called Carvallo after the name of its inventor.

With the introduction of the Carvallo cooker, other manufacturing processes have had to be geared up to keep pace with its speedy action.

The peas, which have been previously inspected and prepared for canning, are soaked for 18 hours in four tanks, each capable of containing two tons of dried peas and fitted with water circulation to assist uniform soaking. At the end of the soaking period, the peas are discharged into a trough, fitted with special pea cleaning plates. The trough delivers the peas to the suction tank of a pea pump which lifts them vertically ten feet for delivery to the inspection belt through a strainer for removing the water. On the belt, the peas are finally inspected before they pass to a stainless steel blancher, of an improved design, which gives ready access to the interior of the drum for cleaning. The blanching period is normally in the region of seven minutes at 190° to 200°F. The blanched peas pass through a hot water washing drum which also can be opened for thorough internal cleaning.

The hot peas then pass to the small storage hopper feeding the filling machine, designed and built by the company's development department.

The filling machine consists of a brine filling head which fills each can with an exactly measured quantity of hot brine, after which it is transferred to the pea filling head where the correct weight of peas enters. The lid, bearing a code number, is clinched on before the can is transferred to a seamer for the final seaming operation. The combined filler/seamer unit operates at 200 cans per minute. The peas are fed to the filler by a vibratory conveyor which, by maintaining a constant head of peas in the machine hopper, ensures a high accuracy of fill; similarly on the brine tank, the level is controlled by a float valve to maintain accuracy of brine fill.

The seamed cans pass by elevator to the charging system of the Carvallo hydrostatic cooker where up to 11 cans at a time are pushed by a ram into horizontal, tubular containers attached to the cooker chain passing down one vertical leg of the cooker, which is in effect a giant U tube. The cooker has a total height of 40 ft. and is sunk in a pit in the floor to a depth of 27 ft. 6 in.

The temperature in the leg of the cooker gradually increases until the cans enter the cooking chamber, where the temperature can be varied between 243°F. and 248°F., by adjustment of the water level in the vertical legs. The chain carrying the containers leaves the cooking chamber through the opposite leg against a countercurrent of cooling water thermostatically controlled. The cans are finally discharged from the tubes by a ram which ejects them on to the wire rope for conveyance to an automatic case packer where 24 cans are packed into a fibreboard case. The cases then pass to a case gluing and sealing unit for closing before final despatch.

New Food Machinery

Two new machines have been evolved by Filling Machines Ltd., the first of which will provide the meat manufacturer with an automatic sausage maker, producing single sausages to a predetermined length. Sausage meat is extruded, encased along a conveyor and into a special tunnel which feeds into a marking off section where the cased, extruded meat is divided into appropriate lengths and then cut, in a subsequent section, into the required lengths. If desired, this machine can be linked to a wrapping and packing unit, making the whole process automatic.

The second machine is an automatic filler for flat bag products, such as custard powder, and is designed for use where a free running powder can be filled into an envelope pack. Flat bags are taken from the magazine by a rotating head carrying the open bag or envelope below a discharging feed. The filled bag is then dropped by gravity to an adjoining rotary unit which gums, seals, and finishes the pack, before delivering into a discharge channel for bulk packing. Normal output is in the region of 4,200 packs per hour.

Both these machines are in the nature of prototypes, but more advanced units are in the process of construction.

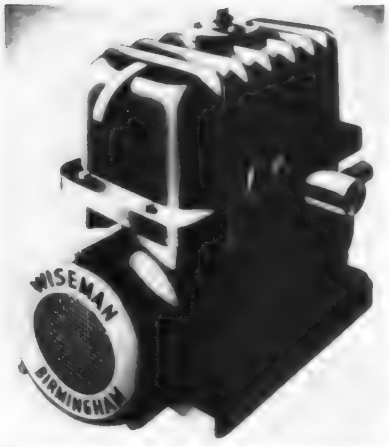
Labelled Cakes

A new range of cakes, each of which bears a metal label printed with the name of its flavour, is being marketed by Kunzle. This method saves a considerable amount of hand labour in decorating and enables the company to supply the goods at a competitive price for self service stores trade. The range of flavours includes strawberry, coconut, pineapple, orange, and hazelnut.

After film wrapping, the cakes are packed in gross lots in fibreboard containers for despatch to the sales points.

Agar-agar from Denmark

Danish agar-agar, in powder and strip form, is being imported by Sidney Herbert and Co., who have found that it compares favourably in price with the Japanese product.



A typical totally enclosed gear unit which can be used with a wide range of food processing equipment.

Gear Units

As a result of their early work on wheels and pinions for traction drives on electric railways and tramways, Alfred Wiseman and Co. have developed special steels and new hardening processes.

Present tendencies have created a demand for efficient self-contained gear transmission units and combined motor units requiring the minimum of attention and maintenance. Such units find wide application in the equipment used in food production, being clean and having practically unlimited variety both in speed ranges and the power that can be handled.

The company are pleased to advise on the application of gear units and have available a service for food manufacturers and others with power transmission problems.

Electrically-operated Equipment

It has been the custom of the British Standards Institute/Canadian Standards Association Approvals Agency to supply lists of electrically - operated equipment manufactured in the United Kingdom and approved by the Canadian Standards Association with addresses of the makers of the equipment.

As the number has increased considerably over the last 12 months, it has become impracticable for them to issue duplicated lists and the information has now been prepared in the form of a booklet, which also includes the names and addresses of the Canadian representatives.

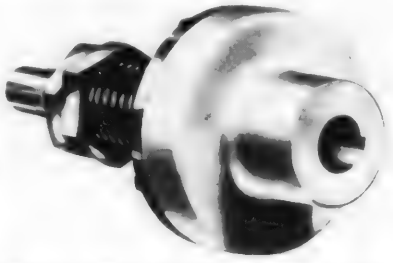
The booklet contains the names of the manufacturers who obtained approval before March 31, 1954, and supplementary lists will be issued at six-monthly intervals. Further copies of this booklet and, when available, supplementary lists can be obtained free of charge from the B.S.I./C.S.A. Approvals Agency, 2, Park Street, London, W.1.

Canned Foods Advisory Bureau

After a lapse of nearly 15 years, the Canned Foods Advisory Bureau, sponsored by The Metal Box Co., has been re-opened to give advice and information to the general public on all aspects of canned foods. The Bureau aims to become a focal point through which the views of the consumer can be passed on to the canners, and the activities and problems of the canners made known to the consumer.

Equipped with a specially appointed experimental kitchen where frequent and regular demonstrations will be staged before invited audiences and members of the public, the Bureau will also publish recipe leaflets and other instructional pamphlets and will act as an information centre with facilities to which the consumers, manufacturers, and distributors of canned foods have equal access.

Situated at 17, Wigmore Street, London, W.1, the Bureau is open daily from 9.30 a.m. to 5.30 p.m. (Saturdays, mornings only).



Torque limiter adjustable to transmit any desired torque between 100 and 400 lb. in.

Torque Limiters

A complete range of torque limiters, each of which is easily adjusted to transmit any desired torque within fairly wide limits, is being manufactured and marketed by Fords (Finsbury) Ltd. It automatically disengages as soon as the set torque is exceeded through a mechanical overload occurring in the machine drive. This ensures that no part of the machine is damaged through accidental overloads, and consequently, no strengthening-up of parts is necessary to withstand overloads, and no shear-pins are necessary in any part of the machine. The torque limiter can be used as a coupling in a shaft, or combined with a V-pulley, a chain sprocket, or gear drive; it can also be combined with an electric cut-out switch to stop the machine when an overload occurs and the torque limiter disengages the drive.

When the cause of the overload is cleared and the machine is re-started, the torque limiter automatically resets itself in the same angular position, thus allowing the machine to resume operation at the exact cycle point of release.

Marshmallow Maker and Continuous Processor

A British built marshmallow maker and continuous processor with an output of 100 gal. per hour is being marketed by the Creamery Package Co.

By feeding marshmallow syrup through the machine, a first class smooth textured product is produced by the efficient cooling, whipping, and aerating action of the processor; further a continuous supply of marshmallow to the depositor is assured without the need for time-consuming manhandling, necessary with a batch system.

The machine consists primarily of a jacketed barrel of stainless steel or nickel construction around which is circulated cooling water. Inside the barrel, the patented dasher assembly gives maximum whipping action in conjunction with the finely controlled diaphragm type air compressor.

Stainless steel steam heated premixing and holding vats, with the Rotoseal pump and connexions, form with the marshmallow maker a complete continuously operated marshmallow production plant.

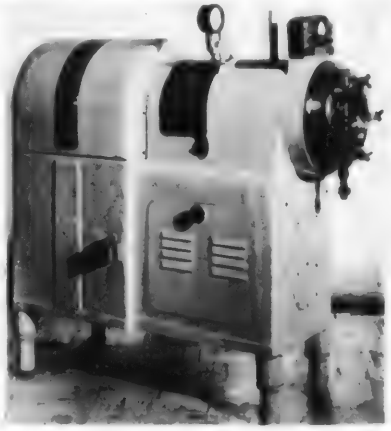
This processor is also suited to the efficient processing of artificial cream for biscuit fillings.

A processor is also available for efficient fat blending, cooling, and plasticising on a continuous basis, utilising chilled water or refrigerant according to the duty to be performed.

The dasher assembly together with suitable scraper blades ensures a continuous mixing and plasticising action and complete spreading of fat over the cooling surface. A separate positive displacement pump forces the fat through the plasticiser.

Necessary ancillary tanks and jacketed pipelines are also available to give a complete plant for continuous operation.

The continuous chiller and plasticiser has approximate capacities of 15-40 cwt. per hour, varying according to cooling range.



The marshmallow maker and continuous processor has an output of 100 gal. per hour. It can also be used for processing artificial cream for biscuit fillings.

Bulk Flour Handling

DEMONSTRATION OF LOADING AND DISCHARGING TECHNIQUE

The bulk wagon with the control panel and access doors open.

A demonstration showing the bulk wagon in action and the installation that has been developed for handling flour in bulk in the bakery after delivery by the bulk wagon was staged recently by Henry Simon.

This is the first wagon of its type in this country to be completely designed for the bulk transport of flour and its delivery to a bin up to 100 ft. above ground level.

The chassis is a standard Leyland Octopus 22 ton and the body is of patented construction in high-tensile aluminium alloy sheeting with vertical pillars of registered design.

The top of the body is fitted with three rectangular loading hatches and a walkway, reached by a ladder on the nearside front of the body. These hatches have special rubber seals serving the double purpose of preventing air loss and keeping the flour free from contamination.

The capacity of the bulk wagon is 850 cu. ft., giving a holding capacity of about 14 tons. The unladen weight on this particular chassis is 9 tons 11 cwt. 0 qtr. 14 lb., thus giving a permitted payload of approximately 12½ tons. The wagon is loaded by gravity from bulk bins in the mill warehouse, the process taking normally about 10 minutes.

Discharging equipment consists of three Aeroflow type dischargers, one at the bottom of each hopper bay. A transverse collecting chute equipped with two short Aeroflow type conveyors at the rear of the wagon receives the flour from the main dischargers and feeds it into two patent Simon blowing seals which meter it into the conveying air stream.

The air supply for the dischargers is supplied by a positive displacement blower mounted under the framing at the forward end of the body. Air for elevating the flour from the wagon to the bakery is supplied by a two-stage positive displacement blower.

The blowers have been specially selected and require no internal lubrication; the risk of oil contamination of the flour is entirely eliminated. The rate of discharge can be varied from zero to maximum by adjusting a simple air valve.

Although the bulk wagon requires only one intake pipe, there is no reason why it should not discharge to any one of a number of existing 3 in. pipes or pipes of a different diameter. Under normal conditions a full load can be discharged in about 45 minutes.

A control panel is fitted into the rear of the vehicle and the operator can control the whole of the discharge process without returning to the cab.

The wagon is simple to operate. All that is required is to connect the flexible hose to the blowing seal and to the bakery intake pipe, set the air controls, and apply power.

For the purpose of the demonstration, the wagon discharged to the bulk flour handling installation in Simon's experimental mill. This is similar to the receiving plants that are being installed by the company in bakeries. It consists of a single pipeline, a multiway valve, and flour collectors discharging to bulk bins. Visitors were able to see the bulk flour handling plant in operation.

The multi-way valve has been designed to direct flour from a single pipeline to any one of a number of bins. It consists of a rotor connected to the intake pipeline on one side and to eight pipes, each leading to a bin, on the other. Each of the eight pipes discharges to a flour collector which separates the flour from the conveying air and allows it to fall into the bin.

The experimental mill was built some five years ago to enable the company's research, design, and development departments to conduct tests on new machines, techniques, and installations on either a pilot or a commercial scale. It is fitted with a pneumatic wheat cleaning plant and a pneumatic flour mill, as well as numerous other installations of which the bulk flour handling plant is one.

Glass for Export

The recent Glass for Export exhibition, staged by the Glass Manufacturers' Federation at their new centre at 19, Portland Place, London, showed how the British glass industry contributes in supplying many millions of pounds' worth of its output for export.

Other items of note at the exhibition were the use of glassware in the home, for lighting, for the laboratory and scientific instruments, for radio and television, for photography, and for building.

A permanent exhibition, Story of Glass, is also situated at Portland Place and incorporates a comprehensive survey of the history of glass-making and present-day methods of manufacture.

Canning in Scotland

The latest development in Smedley's Scottish factories is the introduction of a new product—baked beans in tomato sauce with sausages and kidney. Both the Dundee and Blairgowrie works are also undergoing development. At Blairgowrie, the firm has installed expensive plant for handling peas, including a new pea viner with a capacity of one ton of shelled peas per hour, and a 21 ton combined pressure cooker and cooler, the first of its type in Scotland. These items are part of a high speed pea plant which the firm is installing at a cost of about £20,000.

Plans have been developed at Dundee for a new method of handling raspberries this year which are expected to result in less breakage of the fruit; the berries will be cooked and cooled in such a way that they are not rotated.

These developments have been encouraged by good export orders for soft fruit from New Zealand, Canada, and other Empire countries. The export of fresh frozen raspberries to the U.S.A. last year reached 1,000 tons; it is anticipated that this tonnage will be exceeded in 1954.

ERECTIONS AND EXTENSIONS

A site near Hawthorn Street, Glasgow, has been leased by H. J. Heinz Co. for the proposed erection of a new distribution centre and warehouse.

*

A new confectionery works is to be constructed at Worthing, Sussex, for J. Whitehouse and Co.

*

A new fish meal and oil factory is to be erected for the Herring Industry Board on a site at Greenhill, Peterhead. The necessary plans have been approved.

*

Plans to carry out extensions to the Crosse and Blackwell factory in Charlotte Street, Peterhead, at an estimated cost of £10,600, have been approved.

■

The erection of a new potato crisps factory on a site off Corporation Road, Birkenhead, is planned by G. W. Driscoll.

COMPANY NEWS

It was announced at the annual general meeting of Van den Berghs and Jurgens that the directors proposed to increase the dividend on the Ordinary Stock from 7½ per cent. to 10 per cent., free of income tax.

In his review of the past year, Mr. J. P. Van den Bergh, chairman, mentioned the difficulties that had had to be faced. On the manufacturing side, the full quota of "pool" margarine and compound had had to be produced for the Ministry of Food and at the same time plans had to be made for the return of brands.

The policy of factory improvement and re-equipment was continued throughout the year and a high proportion of the company's output is now being manufactured by the Votator process.

*

In his statement presented at the annual general meeting of Chivers and Sons, Mr. William B. Chivers mentioned the competitive conditions brought about by the de-rationing of sugar. To meet these conditions, the sales and advertising sections of the organisation and the methods of distribution were being progressively improved.

On the agricultural side of the business, a satisfactory and prosperous position was reported, pedigree livestock gaining notable awards at the various Agricultural Shows.

Mention was also made of the opening of a new and modern factory in Dublin and of the fact that since 1924, the company's farming acreage had doubled and the development of food processing activities had necessitated the bringing into operation of three additional factories.

OBITER DICTA

● "The Happy Cow," garlanded and smiling, is to be the symbol of a campaign to sell butter in competition with margarine.—"*Manchester Guardian.*"

● If the average housewife could see what happened in many slaughterhouses we should become a nation of vegetarians.—*Mr. A. Thomson, President of the British Veterinary Association.*

● Deep down in the heart of every housewife is a certain pride, often suppressed, in doing something with her own hands for her husband; what could more fulfil this desire than the baking of a pie!—"*Quick Frozen Foods.*"

● The fact that much money has been spent on research is the measure of the industry's confidence in its ability to meet competition and to prove that porridge is one of the best breakfast foods.—*Mr. W. Leslie Gavin, President of the Scottish Oatmeal Millers' Association.*

● Breakfast in England since the war has degenerated into a miserable mess of starch and tea; that is the reason why people are so tired before lunch, and why lunch is eaten so early.—*Dr. Franklin Bicknell, speaking at a meeting of the Food Education Society.*

● Apparently the margarine which for 14 years has been good enough for the Ministry of Food to sell to the public is not good enough for private enterprise; manufacturers must raise the vitamin A content by 70 per cent. by order of the Food Minister!—"*Aristarch,*" *writing in* "*Ice Cream and Frozen Confectionery.*"

● Lord Douglas of Barloch and Lord Teviot allege that impurities are going into bread, and say they will not eat it in consequence. As bread at any time contains calcium and salt, all bakers will agree their Lordships are talking through their hats.—*Mr. T. Hagger, replying to views expressed in a recent House of Lords debate.*

● When another magic box is put on the market into which the housewife can dump raw, unprepared food, and be presented after a quarter of an hour with a properly prepared, well-cooked, hygienic meal, will the demand for this box of tricks be even greater than for the washing machine?—"*Metalia,*" *writing in* "*Canning and Packing.*"

BOOKLETS RECEIVED

A new folder entitled "Light on Packaging" has been produced by Benjamin Electric.

■

A leaflet describing the use of the Saunders "M" cock for the handling of industrial fluids has been issued by the Saunders Valve Co.

*

A new broadsheet dealing with the comprehensive range of Prestcold refrigerated display cabinet has been issued by the Pressed Steel Company.

*

Recent leaflets and reprints issued by The Incandescent Heat Co. deal with Temgas high temperature muffle furnaces, high temperature thermal engineering, description of the 500 cu. ft. per hour nitrogen generator, and nitrogen production.

■

Four booklets dealing with the application of alkaline cleaners in the baking, canning and deep freeze, meat and fish products, and sugar confectionery and preserves industries have been published by Joseph Crosfield and Sons.

■

In order to meet the increasing demand for pure carbon dioxide in the food and beverage industries, as well as in many other commercial and military spheres, the Power-Gas Corporation offers mobile and semi-mobile plant producing carbon dioxide in either liquid or gaseous form. Such plant is described in the Corporation's recent booklet.

*

A publication describing the operation of the S.E.I. electro-magnetic transducer system has recently been issued by Salford Electrical Instruments. The system enables a reading to be taken at a distance of up to 1,000 yards from the point at which the actual measurement is made. The new publication includes a general description, describes the standard heads and indicating instruments used with this system, and shows six typical applications in diagrammatic form.

■

A handbook published by the F.B.I. under the title of "Disposal of Waste Waters from Industrial Premises" (price 2s. 6d.) brings together for the first time in one publication all the complicated legal provisions affecting the disposal of trade effluent.

The handbook gives an idea of the magnitude of the problem which industry has to face in carrying on its job with the minimum of damage to fisheries and public amenity, and of the amount of research now being carried out on the technical aspects of the problem.

World Food News

FORTHCOMING EVENTS

Food Trade Exhibition

This year's Exhibition of Food Trade and Industry Equipment to be held from November 3 to 11 at the Parc des Expositions, Porte de Versailles, will comprise two main sections: industrial and retail trade equipment.

Butter-to-milk Factories for Far East

The United States is studying a plan to establish centres in Asia for the production of liquid milk from butter oil, non-fat dry milk solids, and water, according to Mr. Ezra Benson, the U.S. Secretary of Agriculture. They could be built in Asian countries by local governments or individuals, or by private U.S. business firms.

A centre of this type, costing up to 500,000 dollars to build, could also manufacture ice cream, as well as from 40,000 to 80,000 quarts of liquid milk daily; each centre could provide a market for up to 1,000,000 lb. of United States dairy fats each year.

Malayan Rice and Sugar

The Government of the Federation of Malaya has revealed that its rice stocks have become too big, and is therefore reducing imports and cutting prices to encourage consumption.

An official statement said rice was staying too long in reserve and was in danger of becoming stale. The reasons for the big stocks were said to be an increase in rice imports on the free market, now estimated at three times those of a year ago, and the appearance on the market of a heavy local crop.

The statement also announced that sugar importation and sale, which had been handled by the Government, was being returned to private enterprise.

France's First Electronic Bakery

The French Ministry of Agriculture is erecting in the suburbs of Paris France's first electronic bakery. The bakehouse will have a daily output of 24 to 30 tons of bread.

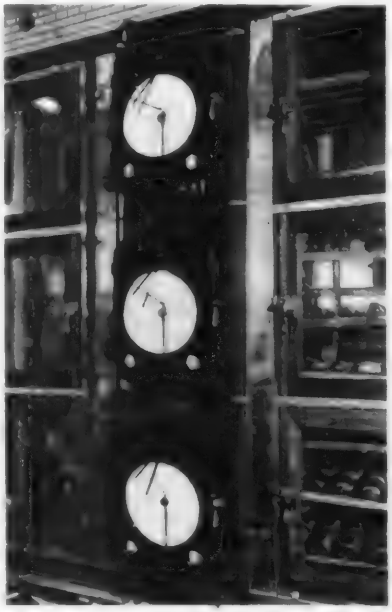
After kneading, the dough will be passed to a weighing and shaping bench, where it will be automatically cut into desired lengths. It will then be transferred to a cooking stove, where it will first be cooked from the inside to the surface; another stove will be used to brown the outer surface. Each batch of 250 loaves will take only 12 minutes to complete the whole process from kneading to cooking. A capacity of one ton an hour, with a staff of only four men, is claimed for the new machine, the use of which will make possible a reduction in the price of bread.

Hot Air Canned Food Steriliser

A new steriliser, using hot dry air in a closed circuit so that the air is re-used, has been developed by Einar A. Ekelund of Stockholm. It is electrically heated, the elements being immediately adjacent to the fans circulating the air. The conveyor is usually separated into two, three, or more chambers, and the air temperature can be controlled at will. The cans run on a rail and are held apart by a round bar attached at each side to an endless chain running over sprockets at each turning point; thus the cans continually rotate. This movement ensures rapid and complete heat distribution throughout the can and its contents. Tests show the difference in temperature between the centre and the outer surface of the can to be negligible.

Very high temperatures can be attained (up to 300° F.) and tests over a two-year period have given excellent results, no burning, discoloration, or other adverse effects being noted. The retention of the vitamins is also higher by this method as the sterilising time is very short.

The steriliser illustrated is about 18 ft. long, 3 ft. wide, and 7 ft. high. It will handle about 800 cans, all filled; the capacity for vegetables is about 3,200 cans an hour (15 minutes run) and for fruits up to 9,600 cans an hour (five to 10 minutes run). This steriliser is built for two different sizes of cans, 211-400 and 301-400 volumes about 11 and 14 oz., but it can be made for any size of round can, and the sterilising cost is very low.



The control panel of the hot air canned food steriliser which can be made for any size of round can.

South African Sugar Output

The South African sugar industry expects a record output of 781,500 short tons of sugar in the 1954-55 season. This compares with an output for 1953-54 of 725,492 short tons.

Domestic consumption is now running at about 580,000 tons per year, leaving approximately 200,000 tons for export.

Larger U.S. Meat Output Predicted

The American Meat Institute has predicted that U.S. meat supplies this year will be the biggest in a decade and the second largest in history. A booming first quarter has led to the view that total meat output in 1954 will reach about 25,000 million lb. if current weather expectations hold. This would compare with the record of 23,200 million lb. produced in 1944 and would be 160 million lb. more than in 1953.

The Institute placed *per capita* consumption this year at 151 lb. against nearly 134 lb. in 1953, but said that the country's population would be larger this year by about 2·3 million.

New Monoglyceride Derivative

In protecting cheese from drying out, or raisins and prunes from absorbing moisture and becoming sticky, an edible waxy moistureproof barrier is needed. Flexible, light coloured waxy coatings, which are not hygroscopic, have many industrial applications. Such a product has been made by acetylating an edible monoglyceride, and is now available on a commercial scale.

Manufactured and sold by Glyco Products Co., under the name of Monocet, its specifications are:

Form and colour ..	Solid, white wax
Specific gravity (25°C.)	0·97
Melting point ..	36°-46°C
Free fatty acid % ..	5 max.
Saponification value	345-362
Iodine value ..	5 max.

Monocet is soluble in certain proportions in methanol, ethanol, toluol, and naphtha. When heated, it is soluble in vegetable or mineral oils, acetone, and ethyl acetate; it is also tasteless and is bland in odour. The melting point, 36°-46°C., of this white wax-like product suggests its use in place of other waxes with melting points in this range. It has certain applications as a substitute for cocoa butter, beeswax, and partially hydrogenated fats. Suggested uses are as coatings for cheese, dried fruits, nutmeats, fruits, vegetables, meats, and fish, as a plasticiser for chewing gum and brittle waxes, and for special industrial and textile fibre coatings.

French Dairy Surplus

French milk and dairy producers have asked for a number of Government emergency decisions to deal with this year's dairy products surplus.

This year's milk output may result in an excess of 20,000 tons of butter, 15,000 tons of cheese, and 3,000 tons of tinned milk. In order to find a foreign market for this surplus, the National Council of Milk and Dairy Producers has urged the setting up of a support fund to be used to subsidise exports.

The fund is to be fed by a special contribution paid by a tax levied on imported vegetable fats used by the margarine industry. If the Government accepts the plan, it is expected to yield a working capital of about 5,000 million francs per year, sufficient to finance exports of the surplus products.

Palestine Citrus Forecast

A poor citrus crop for next season is forecast from Israel. The poorness of the citrus bloom this year means that the next crop will almost certainly be less abundant than the recent one. Mr. H. Isakson, of the Citrus Marketing Board, stated recently that in all probability the excellence of the last crop had tired the trees, it being unusual for fruit trees of this type to crop heavily in successive years.

About 2,000 acres of citrus orchards, formerly in Arab possession, have recently been transferred by the Custodian of Absentee Property to 1,000 families of immigrant settlers in Israel, each family receiving approximately two acres of citrus in addition to land for other crops. These groves yielded 600,000 crates of fruit last season.

Serious retrogression in the citrus by-product trade, formerly Israel's fourth biggest export item, is being experienced in the country, the reason being that the British Food Ministry has halved its purchase of citrus concentrates and the subsidised American industry "dumping" citrus juices in Israel. The improved dollar position in many European countries this year has enabled many of them to spend more on American fruit juices. In their efforts to find new markets for their fruit juices, Israel traders are selling to Guatemala, Burma, and Curaçao.

As Valencia oranges are obtaining higher prices abroad than grapefruit, the Israel Citrus Marketing Board has decided to export the Valencias originally intended for home consumption, and instead to put 30,000 to 40,000 cases of grapefruit in cold store.

Treble Chance for Science

Scientific research in Norway has been allocated £900,000 from last year's State football pool profits.

A remarkable stock for a small shop at Mürren in the Bernese Oberland. Everything has to be carried up by funicular and small mountain railway; in the winter months, the final journey is by sledge.

Photo Leonard Hill Ltd.

OVERSEAS ENQUIRIES

Salted Codfish and Frozen Fish

Vlassis Th. Bertzeletos S.A. of 4, Alipedou Street, Piraeus, Greece, are anxious to obtain a United Kingdom agency for wet salted codfish and frozen fish.

United Kingdom firms interested in this enquiry and who are not already represented in Greece, are asked to write direct to the company giving full details of their offer.

*

Ghee Plant

Modern Radio and Trading Co., 64/69, Edwardes Road, Rawalpindi, Pakistan, propose to set up a ghee (buffalo milk butter) plant capable of manufacturing five tons of ghee per day.

Sanction for this project has not yet been received from the Pakistani Government, but it is suggested that firms who would be interested in supplying this plant should send quotations to Mr. Mohd Khan of Modern Radio and Trading Co., at the address given above.

Okara Ice and Cold Storage Company, P.O. S.C. Mills, Lahore/Multan Road, Okara Distt. (Montgomery), Pakistan, a firm at present engaged in refrigeration of potato seeds and fruits and ice making, also desires to extend its activities to ghee manufacturing and oil expelling, and wishes to buy new machinery.

Canned Meats and Preserves

A. B. Baird Ltd., 322, Duckworth Street, St. John's, Newfoundland, wish to acquire additional agencies of United Kingdom manufacturers of canned meats and preserves.

United Kingdom firms not already represented in Newfoundland, who are interested in this enquiry, should write direct by air mail to Mr. A. B. Baird at the address given, submitting full details of their products, together with all available literature, prices, etc. The delivery position should also be stated.

*

Grocery Lines and Food Products

C. Muscat and Sons, 132, Rudolph Street, Sliema, Malta, wish to import from the United Kingdom, on a sole distributor basis, confectionery and biscuits; canned fruits and vegetables; and all grocery lines and food products.

United Kingdom manufacturers interested in this enquiry are asked to write direct to C. Muscat and Sons, giving full details of their offer.

*

Cured Pork Meat

The International Trading Company (Mr. M. Warren), 1201 Commerce, Houston, Texas, are interested in importing on their own account cured (smoked) pork meat, regular or rindless, canned in Northern Ireland.

United Kingdom firms interested in this enquiry should write direct by air mail to the International Trading Company submitting full particulars of their products together with price lists. Prices should be quoted in dollars and cents c.i.f. U.S. port. The delivery position should also be stated.

*

Fine Quality Confectionery

Jack D. Fink and Co., 327, N. Oak Street, Albany, Oregon, are interested in receiving quotations for fine quality confections, such as butterscotch toffee, other toffees, and chocolates from United Kingdom manufacturers, for sale to exclusive accounts. The enquirers are interested only in establishing a direct connexion and will not consider dealing with U.S. agents of United Kingdom firms.

Firms interested in this enquiry should write as soon as possible by air mail to Jack D. Fink and Co. at the above mentioned address quoting prices, in U.S. dollars c.i.f. Portland, Oregon, delivery dates, and enclosing samples (which will be paid for if necessary). In order to avoid the possibility of damage in transit, it is essential to ensure that samples sent by post to the United States are carefully and securely packed.

All foodstuffs destined for the United States are subject to the United States Food and Drugs Administration Regulations.

News from the Ministries

Ships' Stores

Cheese, cooking fats, margarine, and rice are being removed from the list of foods for which an authority to ship is required when they are being supplied for ships' stores. The Ships' Stores Order, 1953, has been amended with effect from May 9.

Canadian Canned Fruit

Negotiations have started between the Ministry of Food and the Canadian fruit canners with a view to the purchase of some canned fruit. This does not imply a return to normal trade as there is still a restriction on dollar purchases, nor does it commit the United Kingdom to further purchases of canned fruit. The decision to buy is based on special circumstances arising from the purchase of canned fruits under the Mutual Security Act from the United States, linked with the fact that Canada has a traditional interest in the sale of these goods to the United Kingdom.

Vitamin Standards for Margarine

Acting on the advice of the Food Standards Committee, the Minister of Food has made the Food Standards (Margarine) Order which requires that vitamins A and D shall continue to be added to all margarine sold by retail. The Order, which came into force on May 16, prescribes that margarine shall contain between 760 and 940 international units of vitamin A per ounce and between 80 and 100 international units of vitamin D per ounce. The vitamin A content is roughly equivalent to that of butter. The required vitamin D content remains the same as what it was during control (apart from a tolerance of 10 per cent.).

The new Order applies to all home-produced and imported margarine sold by retail, including margarine sold as such by a caterer but not that used by him in made-up foods or in cooking. It does not apply to sales to a caterer.

The Order prescribes the method of analysis to be used for determining the vitamin A content of margarine. In view of the difficulties involved in the estimation of vitamin D in margarine, it has been agreed with the manufacturers that they will add the vitamins in the form of a master mix, which should consist of an edible vegetable oil containing either vitamin A and vitamin D, or provitamin A and vitamin D. The manufacturers of vitamins in this country have agreed to produce master mixes for this purpose containing vitamins A and D in the ratio of 940 : 100. Provided this ratio is observed, manufacturers are free to vary the composition of each master mix and the directions for its use according to the requirements of the margarine manufacturer. Any edible vegetable oil may be used as a diluent.

The firms proposing to manufacture master mixes have given an undertaking to the Ministry of Food that in all master mixes supplied to margarine manufacturers, vitamins A and D (or provitamin A and vitamin D) will be present in the ratio of 940 : 100; that samples of master mixes will be made available as and when required by the Minister; and that the medium used will be pure, edible oil.

Importers of margarine are advised to obtain from their suppliers a warranty that a master mix containing vitamins A and D (or provitamin A and vitamin D) in the ratio of 940 : 100 has been used in the manufacture of the margarine.

Australian Meat Prices Guarantee

The Australian Minister of Commerce and Agriculture, Mr. McEwen, has announced the outcome of the Australian Meat Board's negotiations with the United Kingdom Ministry of Food in regard to the switch from bulk purchase of Australian meat to private trade.

The essential features of the change will be :

(*a*) Lamb and mutton exported by the trade after July 1, 1954, direct to importers in the United Kingdom will be sold on the open market under methods similar to those applied pre-war. In the case of beef, this arrangement will operate from October 1, 1954.

(*b*) A schedule of minimum prices has been agreed between the two Governments to operate for the 12 months commencing October 1, 1954, and ending September 30, 1955. Minimum prices after September 30, 1955, will be negotiated before that date, when the operation of the contract itself is to be reviewed.

(*c*) In the event of market prices for the various classifications of meat averaging below the minimum prices during the year 1954-55, the Ministry of Food will make a payment to the Australian Government corresponding to the amount of the deficiency in respect of each classification separately, *viz.* beef, lamb, and mutton.

(*d*) A method of determining the deficiency has been agreed between the two Governments and will involve a procedure designed to measure as accurately as possible the weighted average level of wholesale prices of Australian meat on the United Kingdom market.

(*e*) In the event of deficiency payments being made by the British Government, such payments will be kept separate for each of the three classes of meat and the Australian Meat Board is at the moment examining methods of applying the deficiency payments for the benefit of the producers of the respective classes.

Imports of Eggs and Egg Products

Licensing arrangements for future imports of frozen whole hen eggs and hen egg products from certain countries have now been made by the Board of Trade, and are contained in Notice to Importers No. 647.

Carcass Meat and Offals

Following the announcement by the Ministry of Food that carcass meat and offals would revert to private trading on July 3, 1954, the Board of Trade have now made detailed arrangements for licensing the private import of carcass meat, *i.e.* beef, veal, mutton, lamb, pork, and their offals from various countries.

Details of the method of applying for import licences, together with the type of licence, date of operation, and varieties of meat and of countries covered, are given in Notice to Importers No. 649 issued by the Import Licensing Branch of the Board on May 12.

Nuts, Grapes, and Fruit Pulp

The Board of Trade announce the following import licensing arrangements :

(*a*) Applications may now be made for licences to import edible nuts (excluding peanuts) and non-hothouse grapes from Spain and Spanish overseas territories during the second half of 1954.

(*b*) The validity of existing open individual licences for the import of apricot, peach, and pear fruit pulp from certain countries is being extended from June 30, 1954, to December 31, 1954.

Further details of these licensing arrangements are given in Notices to Importers Nos. 652 and 630 respectively, issued by the Import Licensing Branch of the Board.

Oils from British West Africa

The Ministry of Food's long term contracts with the Produce Marketing Companies of British West Africa for oils and oilseeds will end by mutual consent this summer instead of at the end of 1955.

Shipments will continue to be for Ministry of Food account until June 30, 1954, after which date the British West African Produce Marketing Companies will sell direct to private traders in the United Kingdom.

The same quantity of oils and oilseeds as would have been supplied to the Ministry under the present contracts will be available to private traders if needed, and the Ministry is satisfied that the new arrangements will make it possible for all users in the United Kingdom to obtain a fair share of the British West African supplies.

Information and Advice

This Service is available to subscribers to FOOD MANUFACTURE. If a stamped addressed envelope is enclosed replies will be sent by post, but enquiries cannot be answered by telephone.

Weeping of Synthetic Cream

B.7058. *We should be grateful if you could give us some advice regarding the prevention of weeping of synthetic cream.* (Ches.)

It is possible that the reason why the water separates from the fat is that there is not sufficient fat in the emulsion. There should be about 35 to 39 per cent. fat in the finished cream to give it sufficient body and food value when it is used.

A little milk powder, about 10 per cent., would also help to give the cream some stability. An agar solution, using 2 oz. per three pints of water, is probably one of the best stabilisers when used at the rate of 10 per cent. of the finished product. Other stabilisers may be used with good results, but only when there is sufficient fat present in the cream, and it has been thoroughly emulsified.

Marzipan Meal

B.7068. *We intend to undertake the production of a marzipan meal, and should like to know the extent to which soya flour is used and the quantity of almond flavour which is normally added.* (Australia)

We presume that what is meant by marzipan meal is a dry ground paste containing ground almonds, castor sugar, and possibly soya flour as a filler and binder.

Soya flour may be used up to 5 per cent. of the total mass, and the amount of almond flavour used, which must be a good one, is about 2 oz. per 100 lb. batch. In the kernels prepared for grinding, about 5 per cent. of bitter almonds should be incorporated to produce a good flavour; artificial flavouring is then unnecessary.

Red Currants for Jelly

B.7098. *Could you give us any information on the best procedure for extracting red currant juice, and whether it is possible to can this juice and store it for jelly making at a later date?* (Canada)

Red currants for jelly are preferably harvested when fully mature in order to obtain the finest flavour. They should be thoroughly washed while still on the stem and then passed through a stemming machine. Stemming before boiling is the usual practice, but there are some varieties in which the stems do not impart too much tannic acid to the product. The currants may be milled at this stage in a grater or hammer mill or left whole – there is no general rule about this.

The fruit is boiled in a steam jacketed pan with the addition of some water. A fruit to water ratio of 1:1 has been recommended as the most economical proportion. When lower proportions of water are used a second extraction of the pomace may be necessary to secure a good recovery of pectin, colour, and flavour. After boiling for five to 10 minutes, the juice is extracted from the pulp in a rack and cloth hydraulic press. The pulp is inclined to be slimy in consistency and to assist pressing, it is advisable to add about 3 per cent. of a coarse filter aid to the pulp, to place only a small amount of pulp in each press cloth, and to apply the hydraulic pressure slowly.

The juice is immediately clarified. A succession of operations is found to give the most efficient removal of suspended matter; for instance, the juice is screened, then allowed to settle, the clear layer is centrifuged, heated again to boiling point and filtered brilliantly clear in a pad filter or a filter press with the addition of a filter aid.

Red currant jelly is best made from freshly expressed juice, but it is possible to can the juice for later manufacture into jelly. It would be better to can whole berry pulp and press as required for jelly making. Both for berries and juice, well lacquered cans are necessary to avoid discoloration of the product by the action of dissolved tin on the anthocyanin pigments and to avoid corrosion spoilage. The process recommended is to fill the product at 190° to 195° F. into cans, preferably made from tinplate having a coating weight of 1·5 lb. per base box and coated with a high quality fruit juice lacquer; the cans should then be closed and held on their sides for five minutes before cooling. If cold storage facilities are available, the best method for storing red currant juice for later jelly manufacture is to freeze it in casks and hold at 0° F.

Peanut Butter

B.7099. *We should be grateful for any information on the manufacture of peanut butter which you can let us have.* (Herts.)

There are four operations involved in the preparation of peanut butter, for which a blend of Spanish and Virginian peanuts is usually employed. These are roasting and cooling, blanching, cleaning, and grinding.

The peanuts are roasted according to the desired colour, at an approximate temperature of 320° F. The nuts are then cooled immediately by passing air through them.

Blanching is done mechanically, which removes the germ and the red skin. The nuts are then screened.

It is necessary to subject the nuts to careful picking and cleaning in order to remove both foreign matter and defective nuts.

The grinding process is devised to provide a product of suitable texture which must be fine and granular. About 1 per cent. of syrup is sometimes added during grinding; this improves the flavour and helps to make the product more stable.

Information Supplied

The Enquiry Service has dealt with requests for the names of manufacturers and suppliers of plant, machinery, and materials, and also general information as follows:

B.7025. *Clarification of lard.* (Ches.)
B.7026. *Spray dried egg yolk.* (N. Ireland)
B.7028. *Hydrogenation of fat.* (Surrey)
B.7029. *Electronic sorting equipment.* (London)
B.7032. *Depositors.* (Scotland)
B.7033. *Roasted and salted peanuts.* (N. Zealand)
B.7034. *Cardboard.* (British West Indies)
B.7035. *Plastic hoses.* (Lancs.)
B.7036. *Jam manufacture and apple peeling equipment.* (Derbyshire)
B.7039. *Stirring paddles.* (Scotland)
B.7040. *Automatic packaging equipment.* (Lincs.)
B.7042. *Infra-red cooking oven.* (Notts.)
B.7043. *Sorbitol.* (Lancs.)
B.7044. *Dehydrated onions.* (London)
B.7045. *Testing essential oils.* (Canada)
B.7047. *Bottle washers.* (Lancs.)
B.7049. *Lecithin.* (London)
B.7051. *Drinking fountains.* (London)
B.7052. *Vinegar.* (Scotland)
B.7053. *Bottling of mussels.* (Norfolk)
B.7054. *Christmas puddings.* (Notts.)

Recent Patents

710,040. DISTILLERS CO., LTD.: Production of yeast.
710,001. ARMOUR AND CO.: Process for treating lard.
710,191. BREDT, G., LANGEN, E. G. VON, and LOESSL, O. VON (trading as PFEIFER AND LANGEN KÖLN): Process for the continuous extraction of soluble material from crushed vegetable substances, especially of sugar beet shreds and sugar cane.
710,283. HILGE, P. BERDELLE- (trading as HILGE, P.): Pumping units especially for conveying liquid foods and luxuries.
710,299. MORTON MACHINE CO., LTD., THOMSON, W., LEITH, R. C., and HEPBURN, R.: Machines for mixing batter or similar liquids.
710,383. POWELL, A. J.: Presses for the extraction of oils, fats, and the like.
710,789. DEUTSCHE HOFFMANN-LA ROCHE AKT.-GES.: Process for colouring foodstuffs.
710,817. WANDER AKT.-GES., DR. A.: Process for the production of aqueous solutions containing lipoid-soluble vitamin.
710,885. GAUNT, J. G. (Louisiana State University and Agricultural and Mechanical College, Board of Supervisors of): Method of separating sugar juice, pith, and fibre from sugar cane and like stalks.
710,979. NIEDZWIEDZ, B.: Method of preservation of fruit and vegetables.
710,995. GENERAL FOODS CORPORATION: Flavouring material and gelatin product.
711,352. AKTIEBOLAGET SEPARATOR: Method of producing oil from vegetable or animal material.
711,432. MIAG VERTRIEBSGES.: Method and an apparatus for the continuous extraction of fatty oil from materials having large water contents, and the subsequent drying of said materials.
711,568. DREW AND CO., INC., E. F.: Production of confectioners' hard butter.
711,754. MERCK AND CO., INC.: Separation of vitamin B_{12} active substances.

ABSTRACTS OF BRITISH PATENTS

Imitation Soft Fruit

This invention relates to the manufacture of soft impervious edible bodies useful for imitation soft fruit, *e.g.* imitation cherries, and has, as its object, the production of such bodies which will have a pleasanter flavour than edible bodies of the aforesaid kind that have hitherto been manufactured and which will closely simulate the flavour of natural fruit.

A process for manufacturing soft impervious edible bodies is known which comprises forming a solution of a soluble alginate or soluble alginates into bodies of the desired form and then setting the formed bodies to the desired degree of solidity by causing the unsolidified bodies to react with a setting solution of a salt or salts, which is or are adapted to form a harmless insoluble alginate or harmless insoluble alginates with the soluble alginate or alginates, and also glycerine or a carbohydrate material, *e.g.* sugar, malt, or dextrin.

In order to increase still further the resemblance of the flavour of the manufactured edible bodies to that of natural fruit, the acid employed in the setting solution may be added thereto in the form of natural fruit juice.

708,992. *P.S.S. (Holdings) Ltd.*

Food Mixing Machines

This relates to food mixing machines of the kind comprising a housing, in which is a motor, which in turn drives a vertical shaft adapted to drive a mixing bowl with which co-operates a dolly or whisk.

Generally, the drive from the motor to the vertical shaft is through a reduction gear, as the speed of rotation of the bowl has to be relatively slow. However, some attachments, such as an emulsifier or liquidiser, require to be driven at relatively high speeds; the object of this invention is to provide means whereby such attachments may be driven direct from the motor shaft, while at the same time retaining the drive to the mixing shaft through reduction gearing.

706,523. *Harold Thomas Lamb.*

Oatmeal Gruel

Oats, oat flakes, or oatmeal first of all have moisture removed by careful heating to, for example, temperatures not exceeding about 50°C., in such manner that the moisture content of the initially dried product is not more than about 3 per cent. The material is then subjected to rapid heating to temperatures which do not greatly exceed 100°C. When the desired final temperature is reached, the material is cooled rapidly to room temperature. By means of this treatment, the natural thickening power of the oat starch is fully retained and is no longer detrimentally affected by the preparation of the gruel in the home.

It is freed from any husk substances still present, for example, by a milling or screening process. The fine flour thus obtained is mixed to a paste with a small quantity of liquid, and the pasty material is subjected to a heating action, as a result of which there takes place a decomposition with partial glutinisation. The decomposed material is carefully dried and can then be supplied to the consumer in flake, powder, or lump form.

706,673. *Friedrichsdorfer Zwieback- und Nahrmittelfabrik Milupa-Pauly, G.m.b.H.*

Cleaning Corn

A method is described for separating impurity portions from a mixture of corn portions and impurity portions, comprising the steps of delivering the mixture to a rotary electrode, forming one of a pair of spaced electrodes for discharge thereby through an electrostatic field between the electrodes, maintaining the electrodes at a relatively high difference of unidirectional electrical potential, coordinating the surface speed of the rotary electrode and the potential difference to repel one of the portions and depress the other portion, and separately collecting the corn portions and impurity portions.

The invention also includes a method of separating impurity portions from a mixture of corn portions and impurity portions, comprising the steps of delivering the mixture to a rotary grounded electrode, releasing the mixture from the rotary electrode under centrifugal and gravitational forces, subjecting the mixture adjacent to the point of release from the rotary electrode to an ionising bombardment from a discharge electrode and charged with an ionising voltage of 20,000 to 40,000 volts to depress the mixture particles in proportion to their electrical resistances, rotating the rotary electrode to produce a surface speed of 200 to 300 feet per minute, regulating the rotary electrode speed and the voltage of the discharge electrode centrifugally to repel the corn portions, of greater mass and lesser electrical resistance in advance of the impurity portions, of lesser mass and greater electrical resistance, and separately collecting the corn and impurity portions.

The invention also includes an electrostatic separation apparatus.

706,705. *The Quaker Oats Company.*

Manufacture of Alcoholic Beverages

Attempts have been made to prepare alcoholic beverages, the taste and other properties of which correspond to those of real wine.

It has now been found that excellent alcoholic beverages, particularly of the nature of wine, can be prepared by employing juices or aqueous extracts, not from the fruit, grains, or seeds, but from other plant parts.

The liquid to be fermented is formed by preparing an aqueous extract from plant parts of foliage, leaves, stalks, or root stocks of graminaceous plants, clovers, vegetables, in the fresh condition of the growing plants, hay or straw.

Fermentable sugars are added to the extract and also, if desired, substances which are commonly used for promoting alcoholic fermentation, in amounts conducive to the production of a fermented liquid of the desired alcoholic strength.

The extract may be produced in various ways, such as by squeezing under high pressure or crushing between rollers, boiling out, macerating, digesting, percolating, infusing, continuously extracting and the like treatments.

668,286. *Jacob Gerardus Bruinier.*

ABSTRACTS OF FOREIGN PATENTS

Mincing Machine Guide

Device for automatically guiding material to a mincing machine which consists of a hopper constructed as a rotary member and of a conical or pointed insert rotatably disposed on the base of this hopper, over which the material is fed by means of a fixed or movable guide arrangement through an opening in the container of the feed-worm.

German 891,060. *Seneca.*

Canning of Bananas

Slices of ripe fruit are immersed in sugar syrup of 35° Baumé. A vacuum of 28 to 30 in. mercury is repeatedly applied to remove air bubbles. Excess liquid is then drained off and the slices are macerated to purée and pumped under high pressure through a heat exchanger where the purée is heated to 175°F. Before filling, the purée is cooled to 140°F.

U.S. 2,647,838. *Food Concentrates Inc. and R. T. Stone.*

British patents and trade marks have been selected from the "Official Journal of Patents" and the "Official Trade Marks Journal" and are published by permission of the Controller of H.M.S.O.

Trade Marks

O.K.—709,285. Olive oil (for food), mint jelly, salad cream, and horseradish cream. **George Mason and Company, Limited,** Chelsea Works, 265, Merton Road, Southfields, London, S.W.18; Manufacturers.

QUAKER WHEAT MUNCHIES.—715,803. Cereal preparations (for food for human consumption). **Quaker Oats, Limited,** Bridge Road, Southall, Middlesex; Manufacturers and Merchants.

CARNAL.—721,757. Preparations for making meat tender. **Chemische Fabrik Budenheim Aktiengesellschaft** (a Joint Stock Company organised under the laws of Germany), Budenheim near Mainz Rhein, Germany; Manufacturers.

TELLA'S.—723,373. Confectionery and sweetmeats, none being medicated. **Van Melle's Biscuits- en Toffeefabrieken N.V.** (a Joint Stock Company organised under the laws of the Kingdom of the Netherlands), Olympiaweg, 10, Rotterdam, Holland; Manufacturers and Merchants.

SMOGLETS.—723,480. Non - medicated confectionery. **Thomas Sherwood Oliver,** 10, Bisham Gardens, Highgate, London, N.6; Manufacturer.

DALMORE.—724,230. Meat; fish, poultry and game (other than live fish, live poultry and live game); preserved, dried, and cooked fruits and vegetables; and jellies (for food), jams, eggs, cheese, edible oils, edible fats, and pickles. **Tom Piper, Limited** (a Company incorporated under the laws of the State of Victoria, Commonwealth of Australia), 192, Point Nepean Road, Garden Vale, Melbourne S.4, Victoria, Commonwealth of Australia; Manufacturers.

CANDYLAND. — 725,101. Non - medicated confectionery. **Rogalls (Leeds), Limited,** Spark Street Mills, Leeds, 3, County of York; Manufacturers.

WHITE SPUR.—725,234. Milk products (for food). **Charles Alexander McFarlane,** "Montrose," 18, Ravenscroft Park, Barnet, Hertfordshire; Manufacturer.

CATALETHE.—725,401. Fumigants for preserving foodstuffs. **Petrochemicals, Limited,** Partington Industrial Estate, Urmston, Manchester; Manufacturers and Merchants.

PURITY PAT.—725,436. Sausages. **Belfast Food Products, Limited,** Purity Brand Food Factory, Prince Regent Road, Castlereagh, Belfast, Northern Ireland; Manufacturers and Merchants.

CAVERN.—725,540. Canned meats and frozen meats. **Michie and White, Limited,** 64, West Smithfield, London, E.C.1; Merchants.

RODEO.—725,571. Edible oils and edible fats. **Direct Dairy Farmers, Limited,** 90-92, Lavender Avenue, Mitcham, Surrey; Merchants.

PARHI.—725,661. Edible oils and fats. **A. Goldrei and Company, Limited,** 116, Southwark Street, London, S.E.1; Manufacturers and Merchants.

VELCO.—725,921. Shortening fats for use in the bakery trade. **Glenville's, Limited,** Thames Bank House, Kirkland Place, Tunnel Avenue, London, S.E.10; Manufacturers.

SHAMBA. — 726,021. Canned meats, canned fruits, and canned vegetables. **Kilimanjaro Canners, Limited** (a Joint Stock Company organised under the laws of Tanganyika Territory), Mweka Chini, Moshi, Tanganyika Territory; Canners.

ROPAL.—726,070. Chemical substances used in the manufacture of bread to prevent rope disease and mould formation. **Albert Boehringer, Ernst Boehringer, Ilse Liebrecht** and **Julius Liebrecht,** trading as **C. H. Boehringer Sohn,** Ingelheim am Rhein 22b, Germany; Manufacturers.

LAUGHING COW.—726,132. Non-medicated sugar confectionery and chocolate. **Cowan's, Limited,** 49, Solway Street, Glasgow, S.E.; Manufacturers.

MILKAP.—726,141. Milk drinks (non-alcoholic) containing fruit juices or fruit flavourings. **O. R. Groves, Limited,** 32, Shaftesbury Avenue, London, W.1; Merchants and Manufacturers.

PENGA.—726,143. Canned fruits. **Mather and Crowther, Limited,** Brettenham House, Lancaster Place, London, W.C.2.

REGENCY.—726,238. Jams, marmalade, fruit preserves, and vegetable preserves. **T. W. Beach and Sons, Limited,** Church Street, Evesham, Worcestershire; Manufacturers.

WHIPPSY. — 726,324. Non - alcoholic milk drinks. **Wimpy Grills of Illinois, Inc.** (a Corporation organised and existing under the laws of the State of Illinois, United States of America), 140, North Dearborn, Chicago, Illinois, United States of America; Manufacturers and Merchants.

QUIXA. — 726,365. Cheese. **Towers Creameries, Limited,** Towers Factory, Commonside East, Mitcham, Surrey; Manufacturers and Merchants.

TOFFORINGS. — 726,528. Non - medicated confectionery. **The Westgate Distributors (Cardiff), Limited,** Factory B.3, Treforest Trading Estate, Pontypridd, Glamorganshire; Manufacturers.

GLENCO.—726,539. Edible oils, edible fats, and edible fat compounds. **Glenville's, Limited,** Thames Bank House, Kirkland Place, Tunnel Avenue, London, S.E.10; Manufacturers.

TREATY.—726,589. Margarine, compounds of edible fats consisting principally of lard, shortening fats for pastry, and cooking fats. **Western Margarine, Limited,** Alliance Factory, Western Avenue, Acton, London, W.3; Manufacturers.

VELLO.—728,376. Sausage casings. **James Murray Maxwell and Margaret Forrest Maxwell,** trading as **Murray Maxwell and Company,** 417, Mathieson Street, Glasgow, C.5; Manufacturers.

New Companies

Modernice (Sales), Limited. (530935.) To carry on business of manufacturers of and dealers in ice cream, chocolate, and sweets. Nom. cap.: £4,000 in £1 shares. Life dirs.: S. J. Collins and W. S. Rolfe. Subs.: G. D. Pegrum (clk.), 62-64, Moorgate, London, E.C.2, and F. W. Eve (cashier), 5, Christ Church Mount, Epsom, Surrey.

Barlow's (Southern Counties), Limited. (530727.) 127, High Street, Croydon. To carry on business of wholesale confectioners and tobacconists, manufacturers of and dealers in sugar confectionery and sweets. Nom. cap.: £1,000 in £1 shares. Dirs.: J. F. Barlow, Ashgarth, Kingswood Way, Sanderstead, Surrey; D. J. Barlow, 32, Addington Road, Sanderstead, Surrey; and W. G. Barlow, 70, Elmgrove, Worthing.

Cleghorn, Waring and Company, Limited. (530730.) 20, Chequer Street, St. Albans, Herts. To carry on business of exporters, importers, manufacturers of and dealers in merchandise, foodstuffs, and provisions. Nom. cap.: £1,000 in £1 shares. Dirs.: T. H. Cleghorn and Winifred R. Cleghorn, 6, St. Peters Close, St. Albans, and C. C. Waring, 4, The Ledgers, Cuckfield, Sussex.

Technology Publications, Limited. (531037.) Stratford House, 9, Eden Street, London, N.W.1. To carry on business of publishers, proprietors, and printers of trade and technical journals. Nom. cap.: £100 in £1 shares. Dirs.: W. L. Hill (permt.), Crux Easton, Nr. Newbury, Berks.; W. G. Norris, 112, Wanstead Park Avenue, London, E.12; and B. Mack, 21, St. Matthews Road, London, E.2.

T. Latus (Sutton Bridge), Limited. (531038.) Dock Gates, Bridge Road, Sutton Bridge, Lincs. To carry on business of manufacturers of and dealers in confectionery, chocolates, sweets, ices, and cooked and prepared foods. Nom. cap.: £2,000 in £1 shares. Dirs.: R. L. Latus, Florence E. Latus, and T. Latus, all of York House, Sutton Bridge, Lincs.

G.C.B. (Burnley), Limited. (531040.) To carry on business of egg merchants, importers, producers, and dealers, bakers' sundriesmen, makers and sellers of flour, yeast, and other ingredients used by bakers and confectioners. Nom. cap.: £100 in £1 shares. Dirs.: to be appointed by subs. Subs.: E. Burchall, 236, Basden Lane, Burnley, and R. Gill, 442, Padiham Road, Burnley.

Cream Biscuits, Limited. (531164.) 1, Tower Chambers, Hoe Street Bridge, London, E.17. To carry on business of manufacturers of and dealers in biscuits, cakes, pastry, and bread. Nom. cap.: £5,000 in 5s. shares. Dirs.: F. Marcantonio (permt.), 43, Hollybush Hill, Wanstead, London, E.11, and Barbara J. Hyman (permt.), 36, Maybank Road, South Woodford, London, E.18.

Vinwell, Limited. (531358.) 38, Poole Road, Bournemouth. To carry on business of animal and nutrition specialists and experts, manufacturers of and dealers in vitamin and mineral extracts and concentrates. Nom. cap.: £700 in £1 shares. Dirs.: Vera A. Dadswell, Baycroft, Panorama Road, Sandbanks, Bournemouth; Irene F. L. Vincent, and P. B. Vincent, 16, Portarlington Road, Bournemouth.

Fresho Food Products, Limited. (532231.) To carry on business of manufacturers of and dealers in provisions and foodstuffs and preservatives for perishable foodstuffs, fruitgrowers, market gardeners, cattle dealers, chemists, glass and bottle manufacturers, and canners and bottlers. Nom. cap.: £100 in £1 shares. Dirs.: not named. Subs.: M. S. Josephs and E. S. Townley (accts.), 36, Southampton Street, London, W.C.2.

Wood Grove Manufacturing Company, Limited. (532353.) To manufacture, preserve, can, pack, bottle, pickle, and deal in foods and provisions of all kinds. Nom. cap.: £4,000 in 3,000 ordinary shares of 6s. 8d. each and 3,000 cum. pref. shares of £1 each. Dirs.: to be appointed by subs. Subs.: S. A. Lloyd (acct.), 109, Gloucester Place, London, W.1, and R. G. Davis (clk.), 86, Cavendish Avenue, London, W.13.

Chocolate Cup Company, Limited. (532435.) 19, Grosvenor Road, New Brighton, Wallasey, Cheshire. To carry on business of manufacturers of moulded chocolate shapes, chocolate enrobers, and manufacturers of and dealers in chocolate and sweets. Nom. cap.: £1,000 in £1 shares. Dirs.: A. T. Atkinson, 16, Glenalmond Road, Wallasey; M. E. Curlender, Greywalls, Noctorum, Birkenhead, and F. Hiscocks, Brook House, Wood Lane, Neston.

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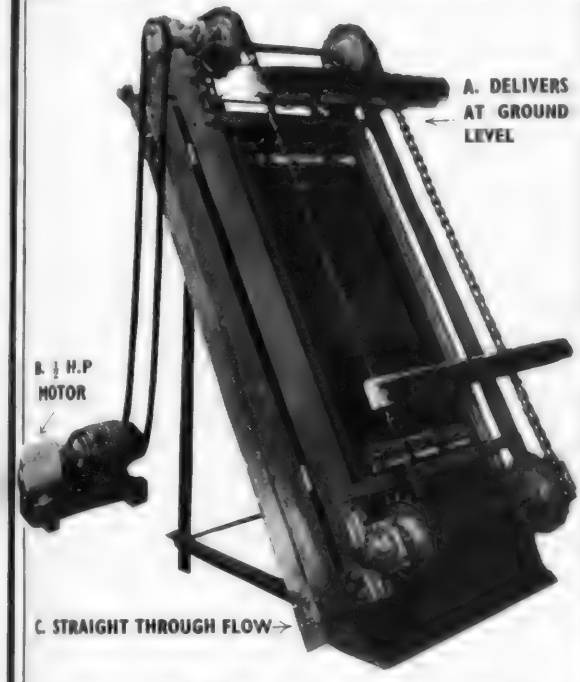

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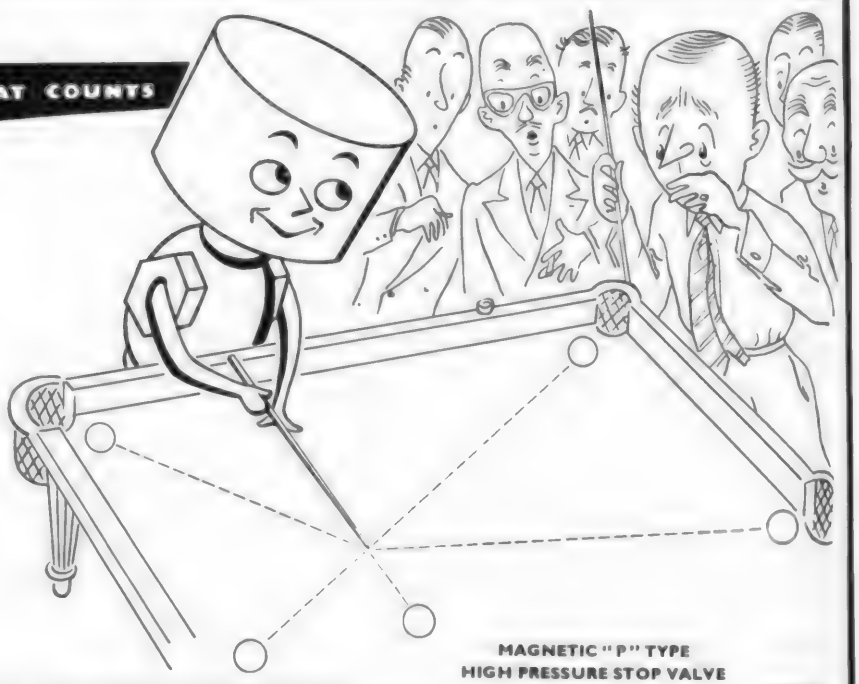

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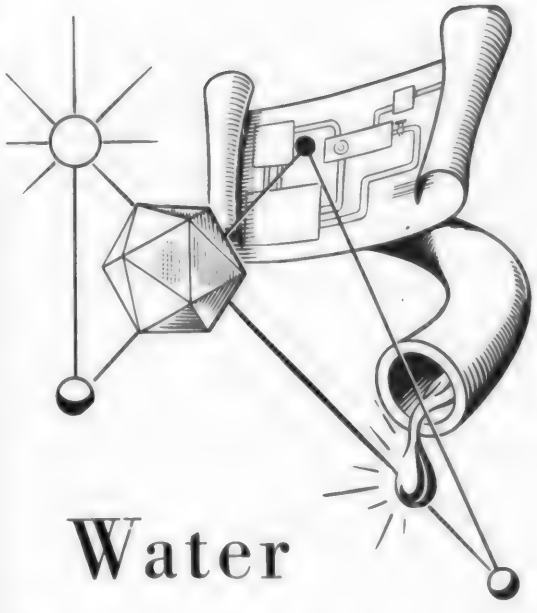

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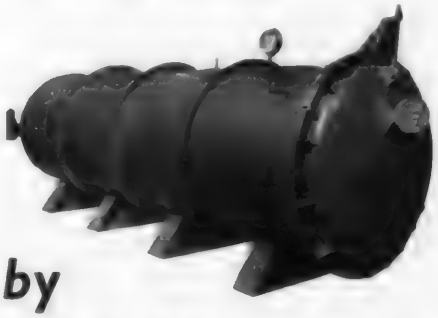

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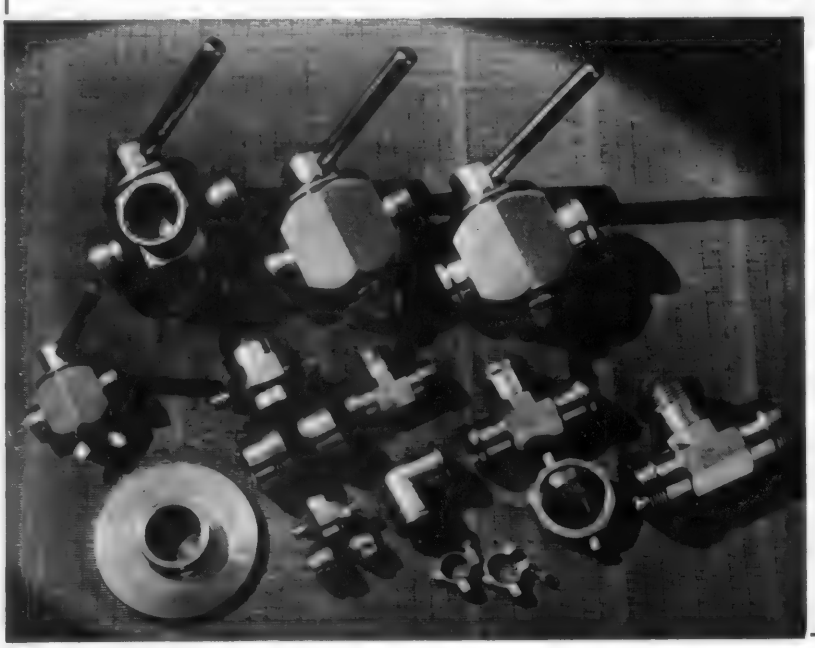

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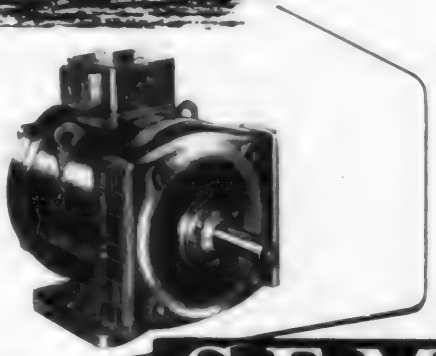

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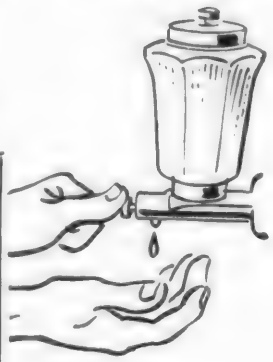

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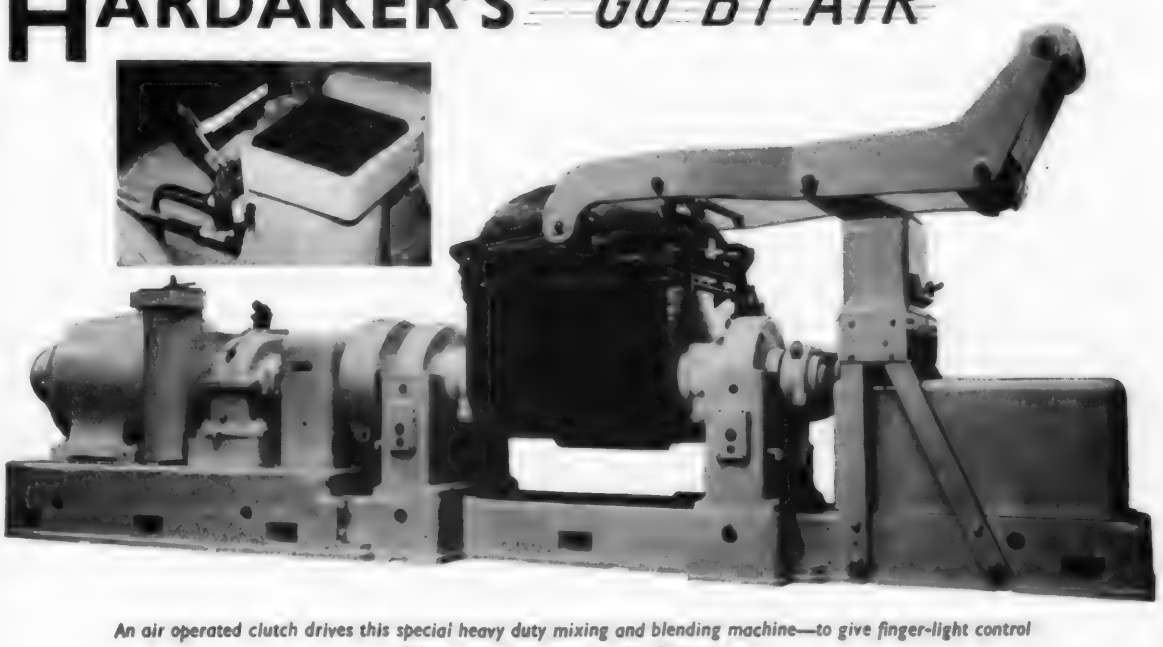

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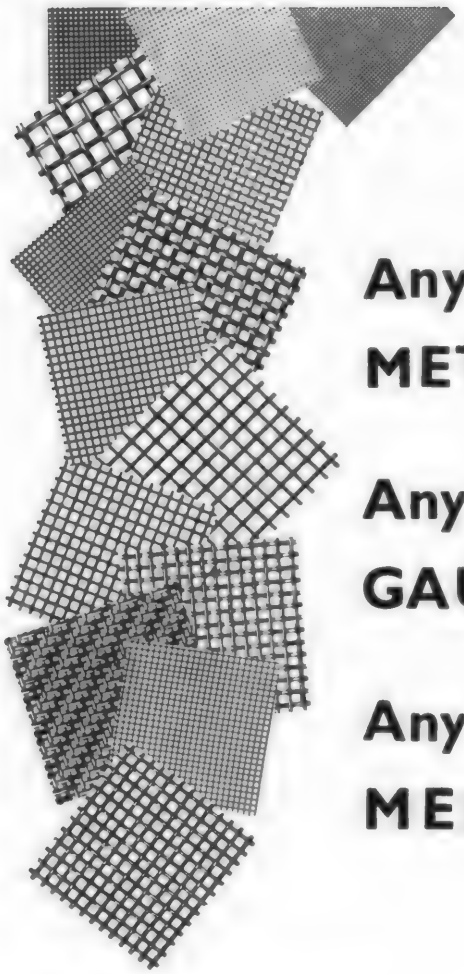

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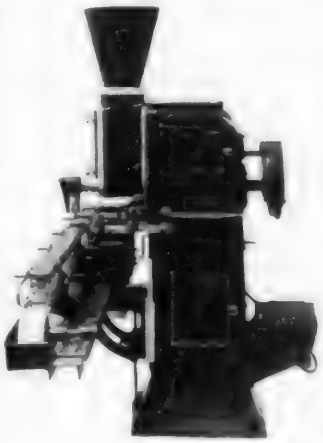

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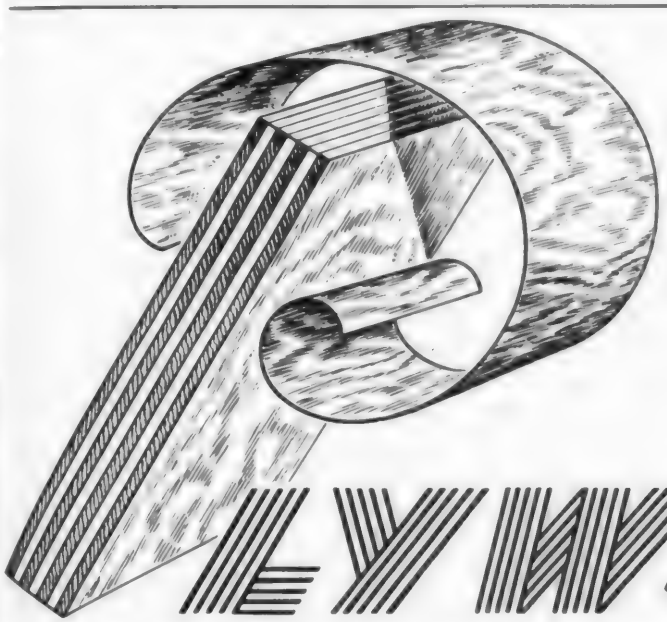

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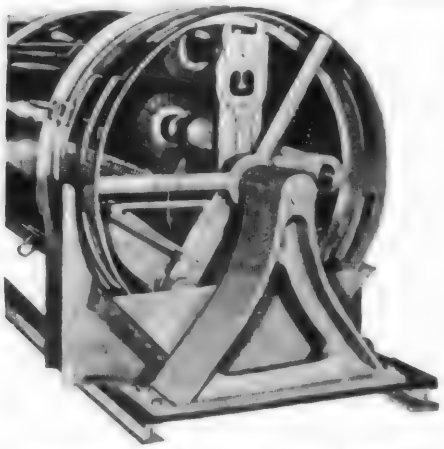

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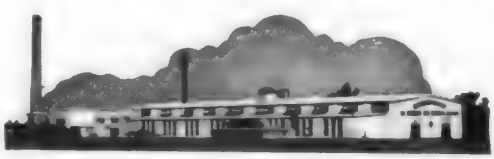

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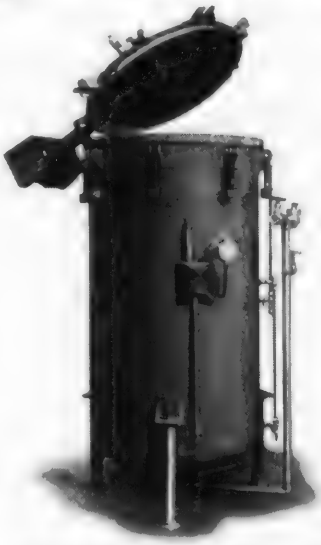

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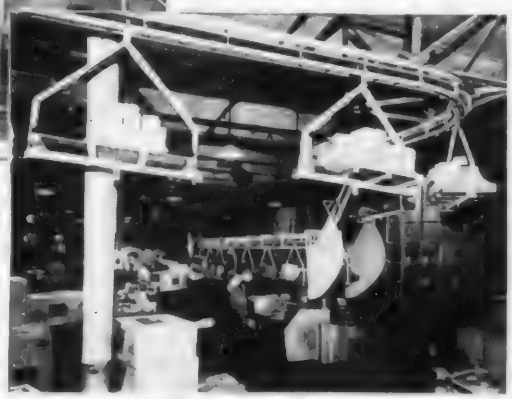

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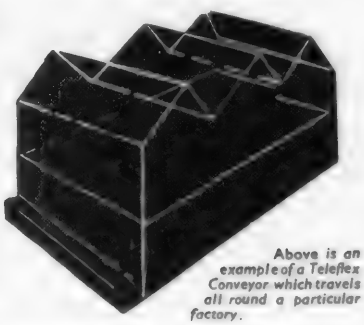

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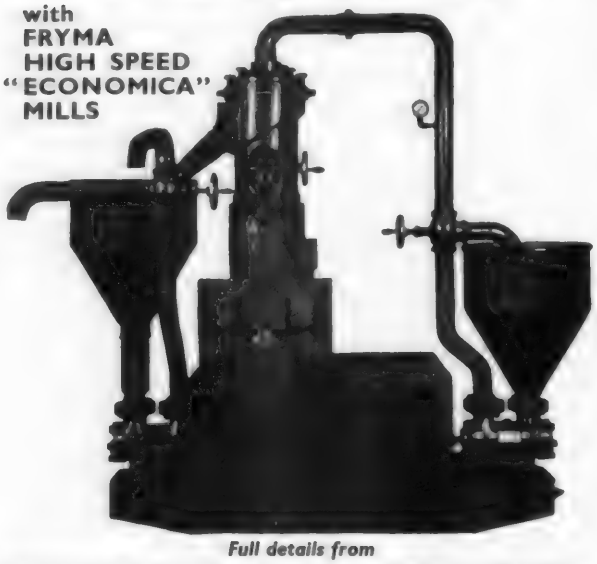

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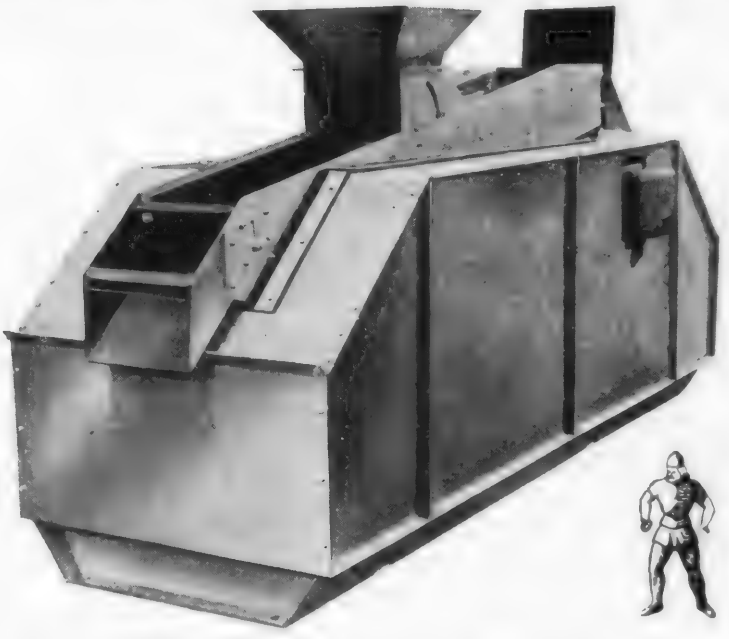

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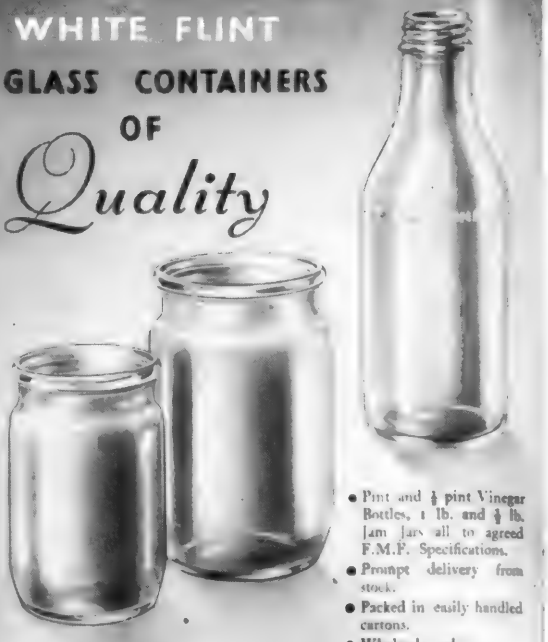

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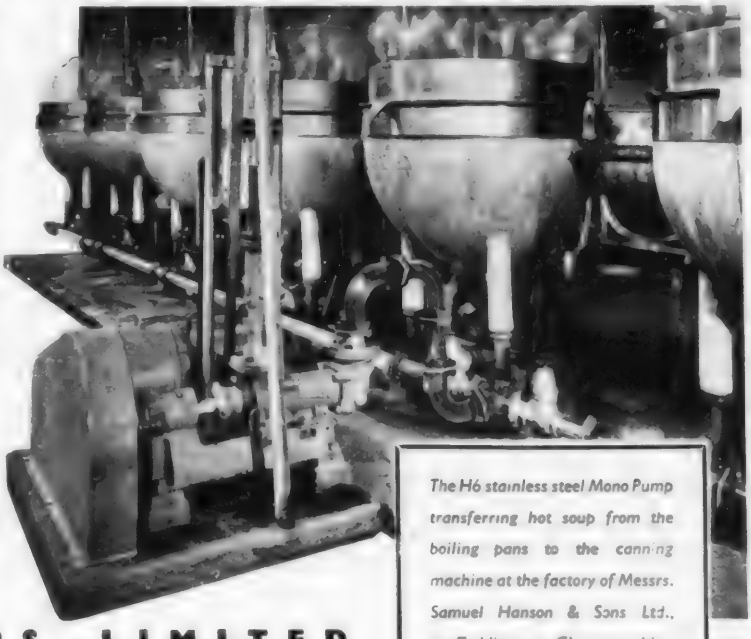

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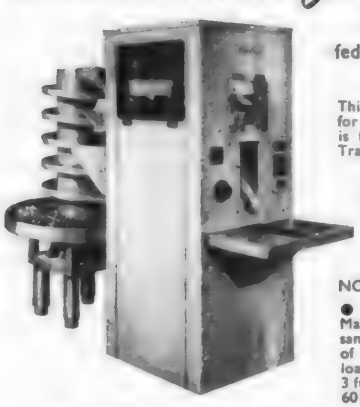

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fed by our Vibratory Spiral Elevator as illustrated.

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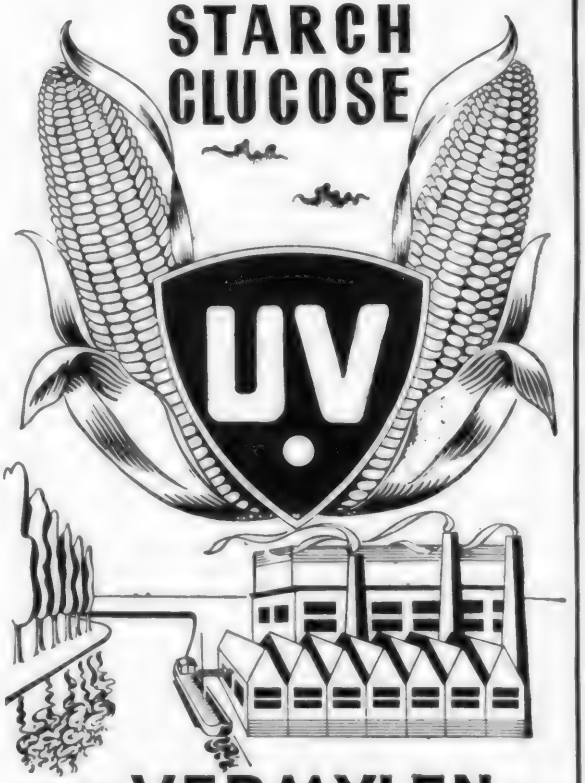

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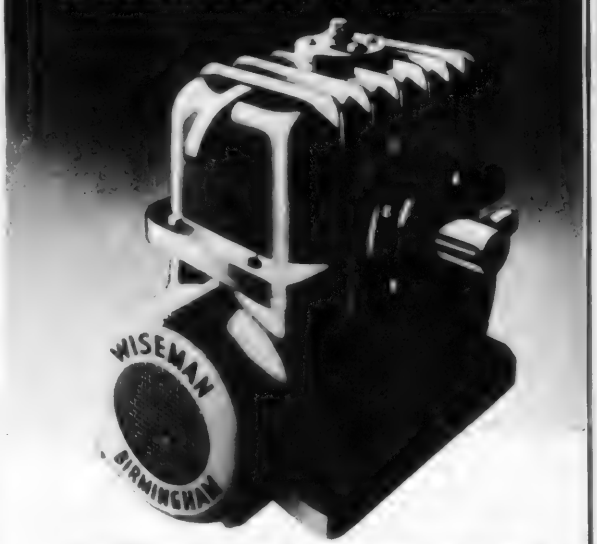

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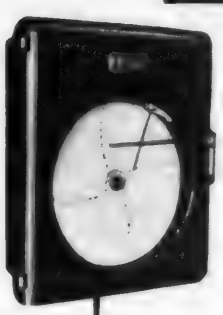

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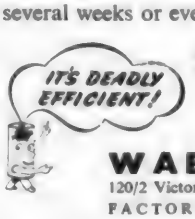

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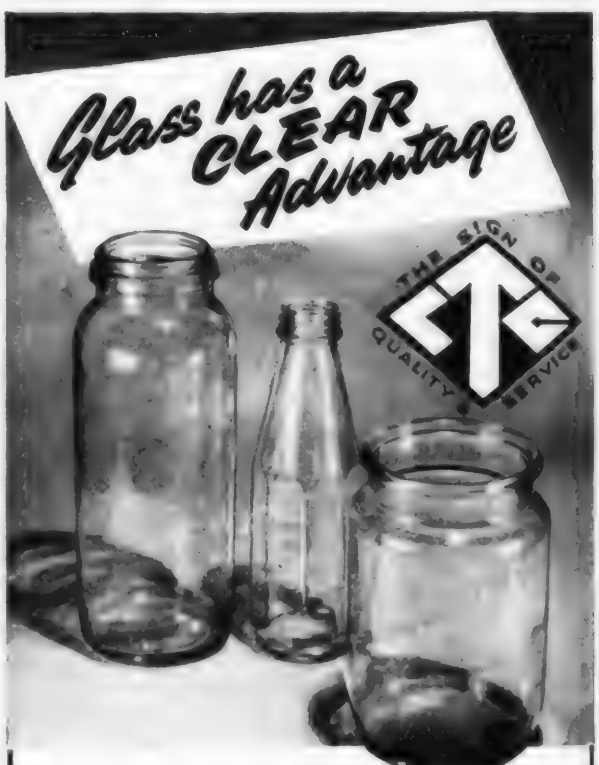

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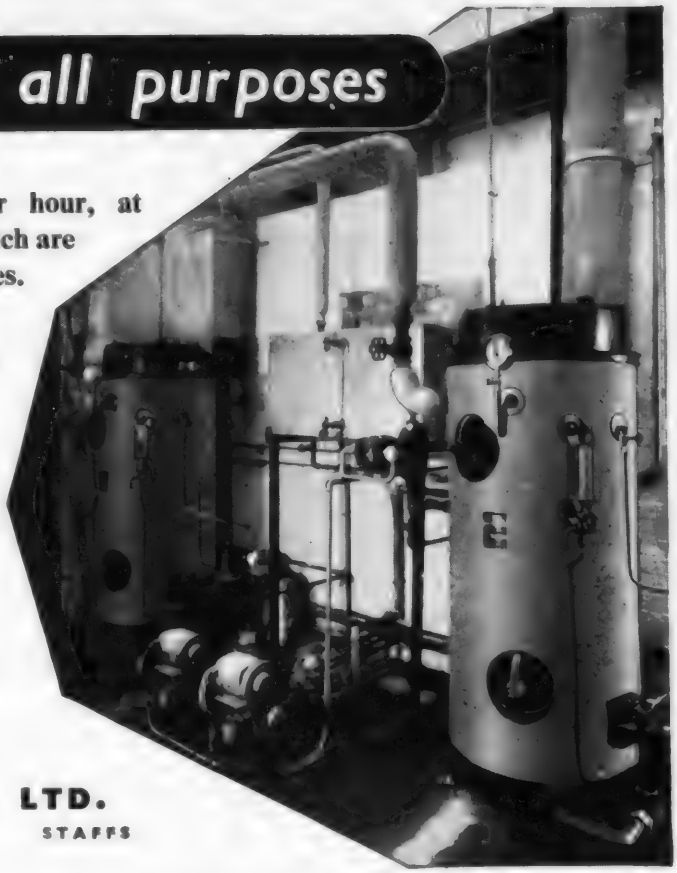

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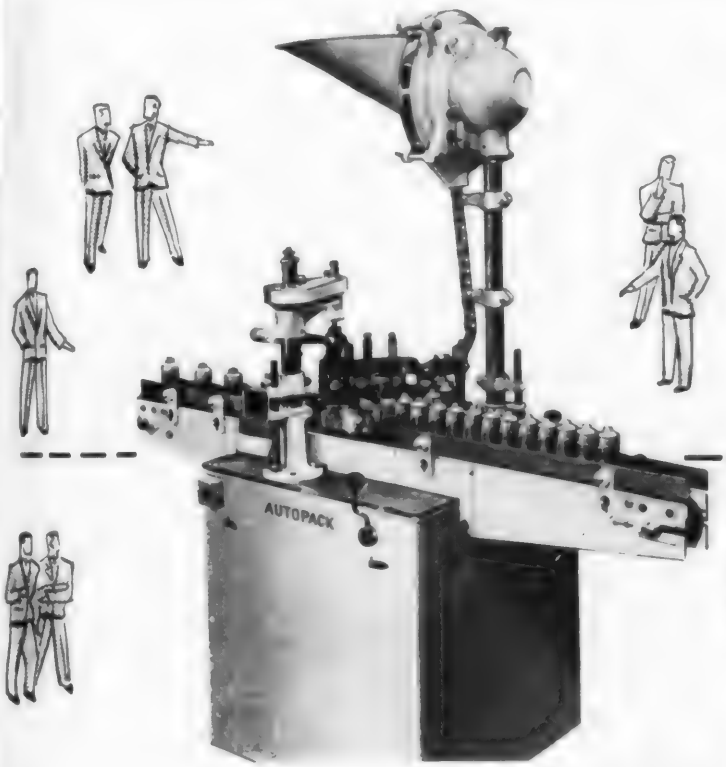

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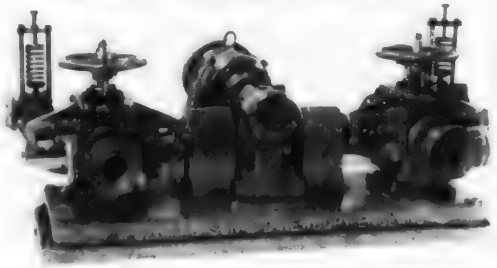

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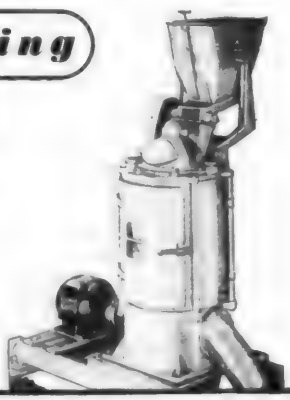

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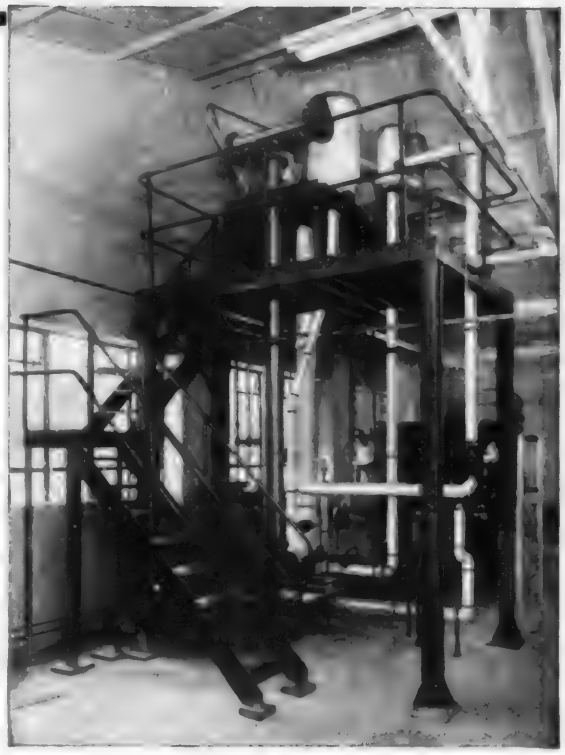

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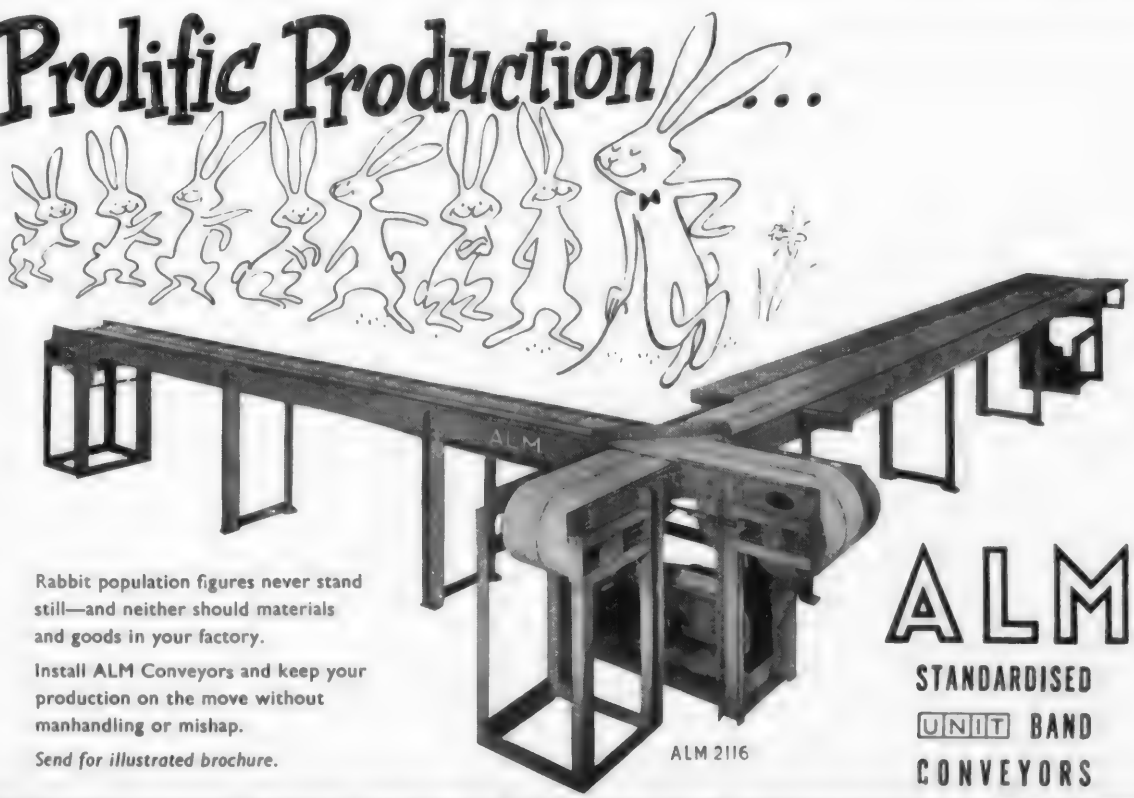

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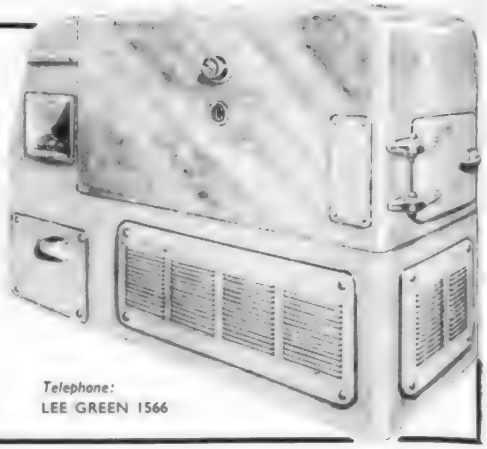

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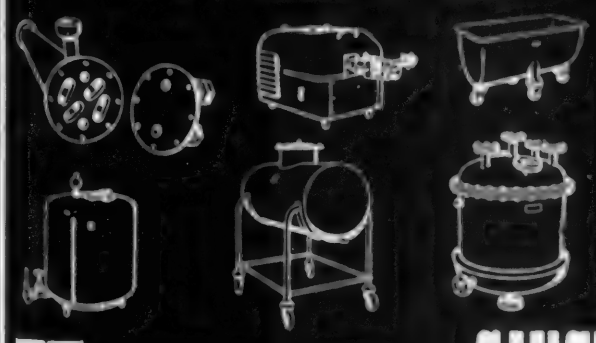

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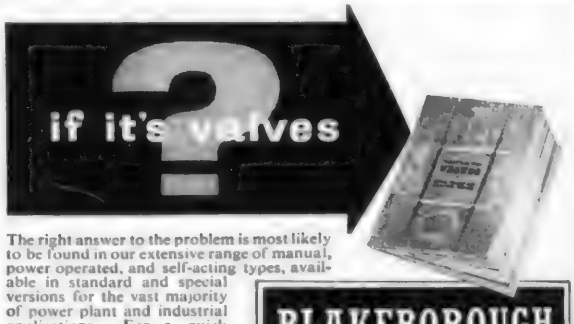

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CHELSEA Polytechnic, Manresa Road, S.W.3 (Department of Botany and Zoology). (*a*) Courses in general and advanced Microscopy will be given on Tuesdays during the session 1954-55, starting on September 28, 1954. (*b*) A course of lectures, with appropriate practical work on "Metabolism of Micro-organisms" will be given on Fridays from 5-9 p.m. beginning October 1, 1954. Tuition fees (if London students)—Course (*a*) (September to June), 30s. Course (*b*) (October to Easter), 20s.—Intending students should apply by letter to the Head of the Department of Botany and Zoology, Chelsea Polytechnic, Manresa Road, S.W.3, not later than August 31, 1954. Enrolment September 22, 6-7.30 p.m.

SALESMAN to sell in London and Southern Counties on behalf of go-ahead manufacturers, Oils, Fats and similar products, to Bakers and Food Manufacturers. Total initial remuneration £600 per annum. New car provided.—Write Box B4702.

A VACANCY exists for a Food Chemist of Degree standard or equivalent, in modern laboratory of an old-established and progressive firm manufacturing chocolate and confectionery. Factory situated in own grounds in Surrey, with canteen and sports facilities, and good train and bus services. A pension scheme is in operation. Salary according to experience and qualifications, but not less than £450.—Write, Chief Chemist, Box B4700.

LANCASHIRE Canners require Foreman-Manager conversant with all types meat canning and able to take complete charge of meat canning section of factory. Knowledge of fruit and vegetable canning an advantage. Good salary for suitable applicant.—Box B4699.

MALE Assistant for blending aromatic oils and chemicals. Previous experience in food or pharmaceutical industries an advantage. Accuracy, reliability essential. Permanency good wages, 5-day week.—Full details to Lautier Fils Ltd., Power Road, Chiswick, W.4.

FOOD Technologist (young) required to act as Supervisor in Cooked, etc., Meats departments of progressive factory, north-east Scotland.—Full details, age, experience salary expected to Box B4707.

PRODUCTION Manager required by medium-size Food Manufacturers in South Midlands with national distribution. Essential qualifications—good administrator with technical training and practical experience in food manufacture.—Write in confidence giving full details of career, including age and present salary to Box B4708.

FOOD Canning company in London invites applications for the post of Production Manager. Age about 35-40 years. Preference will be given to applicant with experience of Meat and Fruit Canning, and will be expected to have had experience in control of staff, modern production methods, and a good record of executive responsibility. Salary of £1,250 per annum and bonus is offered with good prospects.—Send details of qualifications and experience in confidence to Box 2518.

MODERN Meat Products Factory on the South Coast requires a Meat Handling Supervisor. Applicant must be not in excess of 35 years of age, with at least five years of practical experience in Butchering in all its branches. He must also be an organizer and able to get the best out of his staff.—Apply in first place by letter only to Box B4712.

REPRESENTATIVES required with established connection with breweries and food manufacturers to sell plastic plumbing, filters, aluminium and chromium fittings, insulation material, etc.—Write giving full details to Dept. "S," Dohm Ltd., 167, Victoria Street, London, S.W.1.

LABORATORY Assistant (qualified), woman, at Spillers Central Laboratory, Station Road, Cambridge. Graduate or holder of diploma in domestic science. For laboratory test-baking, experimental cooking and some library work.—Applications marked "Confidential," to the Chief Chemist from whom further details may be obtained.

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4d. a word, minimum 10s.

Box numbers, 1s. extra.

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Food Manufacture, Stratford House, 9 Eden Street, London, N.W.1

SITUATIONS VACANT

EXPERIENCED Sauce Maker required for factory production. Married man preferred.—Full details of age, experience, wages required to Box B4681.

A CHEMIST is required to supervise the Laboratory at our Godley, Hyde (south Manchester) Food Factory (Ice-Cream, Sausages and Pies). An Honour's Graduate or equivalent with knowledge of bacteriology would be preferred. Age 25-35 years. The Chemist would come under the direction of the Chief Factory Chemist and the work will involve considerable contact with Production Management and staff. This is a superannuated appointment and salary will be according to age and experience.—Candidates are invited to write in the first instance for application form to the Staff Manager, T. Wall and Sons Ltd., 59, Park Royal Road, London, N.W.10.

EXPERIENCED CHEMIST

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BREWERY LABORATORY

Qualified man preferred, capable of research work.

Brewery within easy reach of London.

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CONSULTING Commercial Chef, now Midland area, life experience in all branches of the canning industry: soups, sausages, ready meal stews, tongues, hams, puddings, roast chickens, meat and fish pastes, vegetables, fruit, fish, sauces and etc.; desires executive appointment. Expert organizer, costings, staff control.—Box B4715.

BISCUIT Production Manager (Indentured apprentice Biscuit Trade with leading manufacturer U.K.) seeks position preferably Commonwealth or U.S.A. At present production Manager biscuit factory in Southern Africa. Full knowledge biscuits, wafers, fillings and all factory routine. 23 years Biscuits.—Box B4687.

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ALUMINIUM MBR. 45 Cans quantity 240,000 lacquer UUA packed in plain cartons of forty-eight. Also 1,000 gross gold lacquer 68 mm. snap-on-caps embossed 1 lb. net.—Eastern Counties Preserves (1940) Ltd., Bridge Road, Long Sutton, Lincs.

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SELL Us your surplus stock of canned foods, biscuits, confectionery, jam marmalade, sauces, custard powder, jellies, spinach, tomato puree, apricot nectar, peas, beans, washing powders, soaps, cosmetics. Send details and samples.—G. Thornfield Ltd., 17a, Balfe Street, London, N.1. Tel.: TERminus 2771.

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TO LET modern 5,000 cu. ft. Zero Fh. Cold Store, offices and yard with space for expansion on long lease, £450 p.a. exclusive. East Midlands.—Box B4709.

CONTINENTAL Study Tours of Food Factories. Plans are being prepared for a tour to Food factories in Germany and Holland. Small party.—Write to S. Moss, M.A.(Cantab.), Clevelands, Stoney Lane, Bovingdon, Herts.

LEADING Food Importers, distributors and exporters with sales organization throughout the United Kingdom and most world markets with large turnover, seeking expansion, interested in contacting manufacturers or canners with reserve capital, at home or abroad, with a view to link up to mutual advantage. Principals only to accountants: J. H. Sisson Esq., Toy Campbell and Co., Ling House, Dominion Street, London, E.C.2.

ADVERTISER is desirous of purchasing a small Sugar Confectionery Business with a Factory from 10,000 to 20,000 sq. ft., in the vicinity of London—North-west particularly preferred. Would consider purchasing freehold of the factory, but would prefer, at outset, to take a lease of the factory premises with the option of buying. Please send fullest details, including description of plant, products made, etc., in confidence to Managing Director.—Box B4713.

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BAKERY together with Factory premises in large South Coast town for sale as going concern. Factory sited in area 80 feet by 160 feet frontage in two roads, eminently suitable for conversion to plant or large Bakery; plans passed for considerable extensions. All main services, A.C., D.C., Gas, scheduled light industry. Present nucleus trade approx. 25,000 p.a., own shops and wholesale rounds.—Box B4717.

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MEADER Pump for heavy slurries or other difficult-to-pump materials. Approximately 8 cu. yd. per hour swept volume. As new, used briefly for experimental purposes only. Complete with hydraulic pump, tank and 400/3.50 motor.—Box 1647, Robertson and Scott, 42, Charlotte Square, Edinburgh, 2.

ALMOST new 6-in. triple cut Wetter Mincer 7½ h.p. 3-phase 400/440 V motor. Can be seen working. Space required. New price £350, to clear £125.—J.B. Food Products Ltd., 381, Albany Road, S.E.5. Tel.:ROD 5061.

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ONE No. 100 18-in. Rapid Grinding Mill by The Whitmee Engineering Co. Ltd., London, S.W.12. Brand new.—Offers to Lloyd Rakusen and Sons Ltd., Meanwood Road, Leeds 7.

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BLACKCURRANT Strigger B.C.H., well maintained, £125. Inspection invited. Near London.—Box B4704.

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URGENTLY wanted Manesty Rotogran Oscillating Granulator in good condition, also Bartleet or Lichtenberg Revolving Pans and Russel Gyratory Sieving Machine.—Write stating price to Nectar Ltd., 26, Islington Park Street, London, N.1.

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ONE 1,000-gall. stainless steel Tank; one Miller Hydro Bottle Washing Machine; one 8-head Vacuum Filling Machine with Crown Corking Machine; one Bratby Bottle Washing Machine; one 30 h.p. Refrigerating Machine; one 15 h.p. Refrigerating Machine; two 100 cu. ft. Refrigerators.—Box B4720.

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COMPLETE Day automatic Packaging Plant for flour, cereals or tea. Makes bags, shapes, fills and seals 30 bags per min. One operator. Seen working by appointment.—Box B4661.

BRATBY and Hinchliffe, fully automatic Labelling Machine for 1- and 2-lb. jam jars, fitted with variable speed A.C. motor drive. 300 dozen per hour. New 1952, little used and in perfect condition, price £450.—Apply Box B4718.

B.C.H. and Kellie 40-gall. copper Jam Boiling Pans, 60 to 100 lb. s.w.p.; Kellie automatic Jam Filling Machine for 1- and 2-lb. jars; B.C.H., A.P.V. and Kellie 8 in., 10 in. and 12 in. stainless steel and copper Pulping Machines, motorized; B.C.H. motorized Gooseberry Snibber; B.C.H. high capacity Vegetable Dicer; Purdy World Bottle Labelling Machine.—Full details from C. Skerman and Sons Ltd., 118, Putney Bridge Road, London, S.W.15. Tel.: Vandyke 2406.

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HORIZ. double trough stainless steel Butter Blender or Mixer by Baker Perkins, size 15½, trough 3 ft. 7in. by 3 ft. 3 in. by 2 ft. 6 in. deep. C.I. end plates stainless steel lined with stainless steel apron. Double "Z" stainless steel agitators driven through from Laurence Scott drip-proof slipring motor 20 h.p., 400/3/50. Hand tilting. Clip on stainless steel cover suspended over pan.

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Automatic Jam Filling Machine by Mather and Platt, with motor drive, capacity of machine approx. 16 cwt. per hour.

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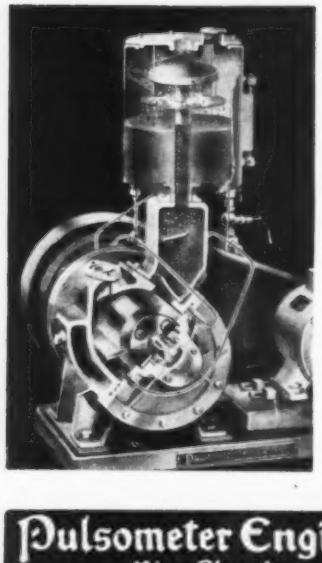

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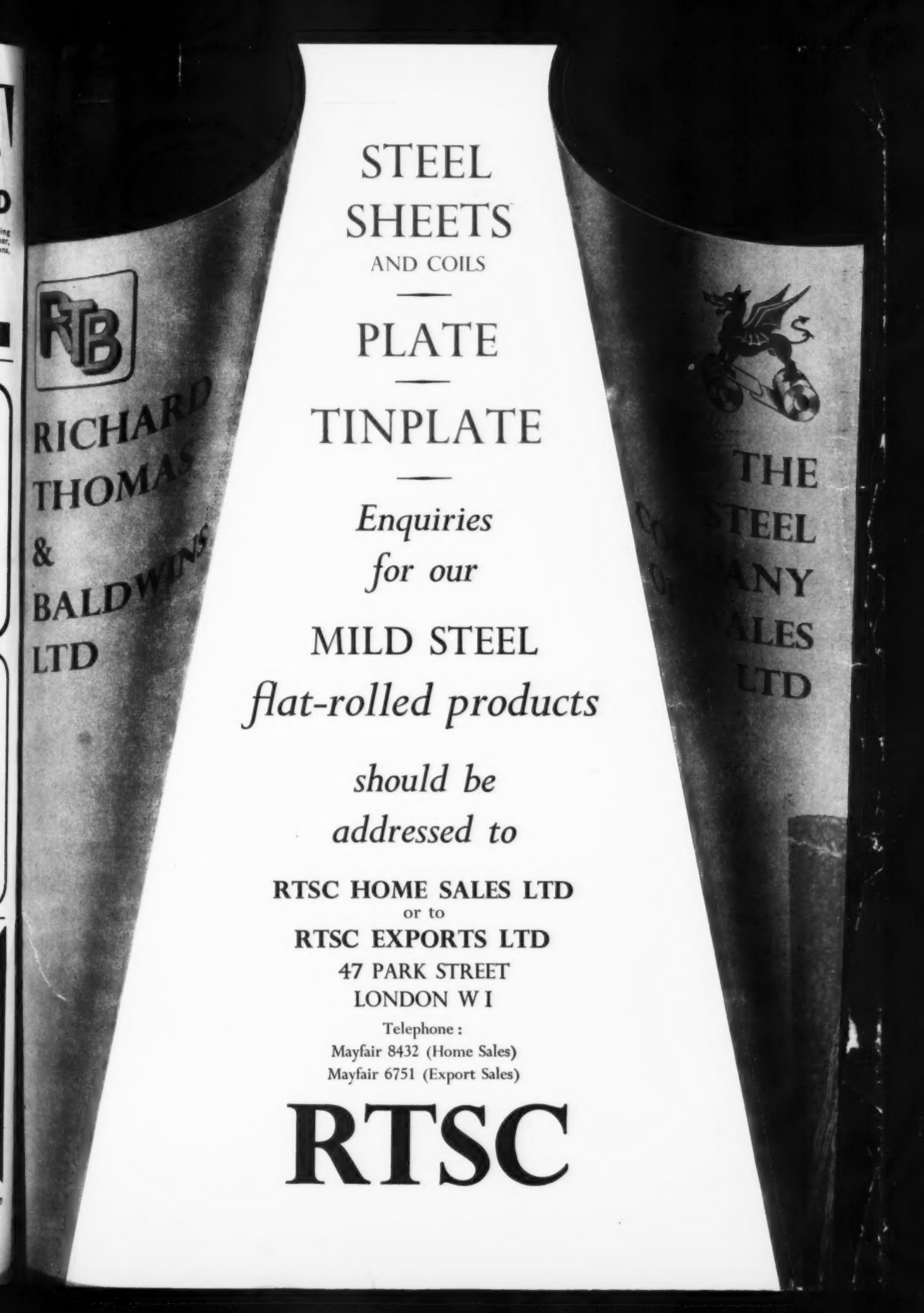
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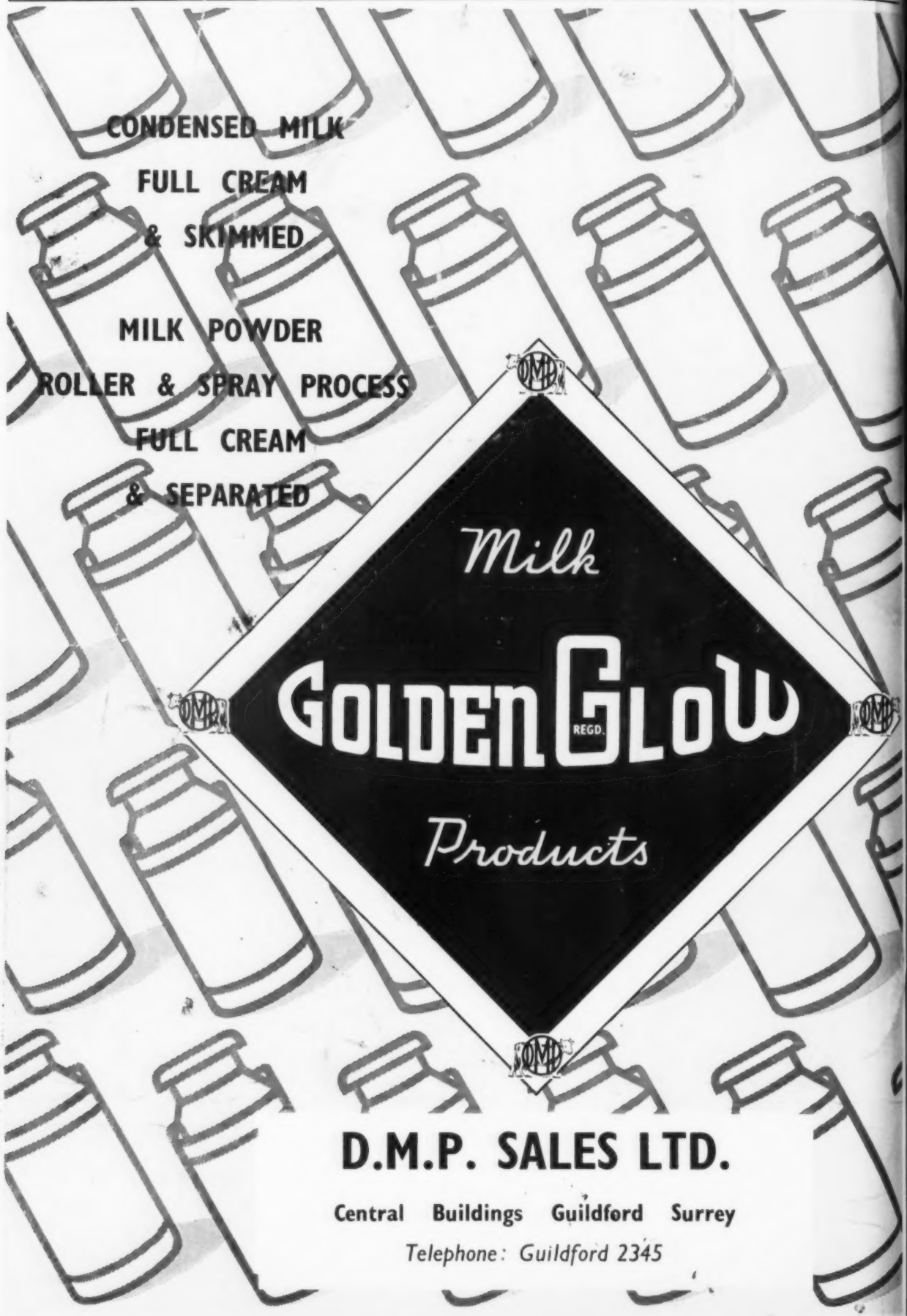

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